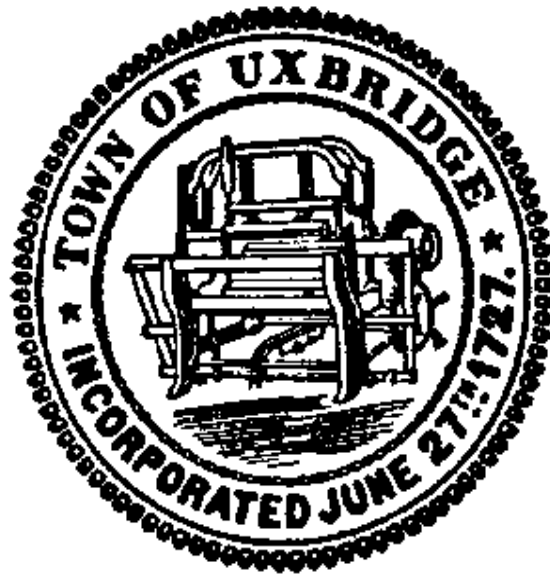


# UXBRIDGE PUBLIC SCHOOLS EDUCATIONAL TECHNOLOGY PLAN



**2010-2013**

*Superintendent of Schools  
George Zini, Superintendent*

# **Uxbridge Public Schools**

## **EDUCATIONAL TECHNOLOGY PLAN 2010-2013**

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**Uxbridge Public Schools**  
**62 Capron Street**  
**Uxbridge, Massachusetts 01569**

## **Introduction**

*The things we accept as normal and enjoy today were considered impossible twenty-five years ago and beyond the power of man to achieve.* In a rapidly changing world, people of vision must seek to be informed. Throughout their school years students will grow to regard technology as one of the many tools that can be used to help them solve problems and improve productivity. These are life skills that will help them thrive in a world where new technologies continue to emerge and information grows ever more abundant.

The development of any comprehensive Technology Plan begins with an internal audit of the needs of all the stakeholders and available resources. In the development of our plan, we revisited the plan written for 2007-2010, surveyed staff, and prepared a document based on Massachusetts IT standards. Staff will be afforded professional development in order to help them to utilize best practice, infusing technology into all areas of the curriculum while building their own skills in the area of technology. We need to provide the infrastructure to access technology through a variety of means and for a variety of purposes.

Our Technology Plan is a continuous, organizational process that provides a road map. As such, it was developed to provide direction and help us understand clearly where we are now, *imagine* where we want to be and how we can get there. It is not static but instead a fluid, ongoing process.

## **Technology Mission Statement**

The technology mission of the Uxbridge Public Schools is to support and enhance the educational goals of the district by developing critical thinking skills and promoting effective use of current and future technologies.

Guided by the Massachusetts recommended K-12 Instructional Technology Standards, the district will integrate technology skills, knowledge, and performance to improve productivity in all areas of the school and community. Technology will be an integral part of the curriculum, instruction, and assessment, providing students with the necessary skills to acquire, interpret, analyze and communicate.

## **Community Profile**

The Town of Uxbridge, with a population of 12,294, lies on the southern border of Massachusetts at the Rhode Island line in south-central Worcester County. Incorporated in 1727, the Town has changed from a farming community to an industrial powerhouse at the onset of the Industrial Revolution. Today, its history is evident in the old mills that dot the Uxbridge landscape and the farms that are still evident in the western highlands of the town. The Blackstone River is currently an integral part of the John H. Chafee Blackstone River Valley National Heritage Corridor. The Town has become a convenient commuter suburb to Boston, Worcester, and Providence. However, the demise of the mills in Uxbridge has yet to be overcome; therefore, with the exception of some small businesses, its tax base is essentially residential.

The pre-school through 12 population is approximately 2,010 students educated at the Early Learning Center, Taft Elementary, Whitin Middle School, and Uxbridge High School.

## **Vision**

The vision of Uxbridge Public Schools is to expand the knowledge and skill in the use of technology by our faculty, staff, and students - through the integration of technology into all areas of the curriculum and student services. By providing equitable access to technology for all, we encourage students to be life-long learners, which in turn will promote a higher development and understanding of the Instructional Technology Standards. We are adopting the Instructional Standards via an articulated learning sequence, a robust infrastructure, and dynamic professional development.

## **Massachusetts Department of Education Benchmark 1**

### **Commitment to a Clear Vision and Mission Statement**

- A. The district's technology plan contains a realistic and clearly stated set of goals and strategies that align with the district-wide school improvement plan. It is committed to achieving its vision by the end of the school year 2009-2010.**

### **System-Wide Goals**

**1. Networking and Infrastructure**

<b>Goal</b>	<b>10-11</b>	<b>11-12</b>	<b>12-13</b>
Continue to convert all hubs to switches and upgrade building network cabling in order to maximize network speeds and internet connectivity.	X	X	X
Maintain the network with current anti-virus and spyware protection and continue to upgrade to the latest versions available.	X	X	X
Maintain CIPA compliant filtering in all schools.	X	X	X
Deploy centralized network operation center connecting all school facilities via wide-area network. The NOC will provide centralized technology support, increased student information management systems, enhanced online learning environments, academic file storage for teacher and student use, and economy of scale financial benefits. This system will ensure secure accessibility from remote locations.	X	X	X
Maintain Current Backup system and deploy newest backup technology when available	X	X	X
Continue to maintain current online IT support and asset management application.	X	X	X
Continue districts technology equipment replacement plan	X	X	X
Build wireless capabilities in each building, as required by curriculum and instruction.	X	X	X
Upgrade district’s current technology disaster recovery plan to include future enhancements to network and infrastructure	X	X	X



**2. Hardware**

<b>Goal</b>	<b>10-11</b>	<b>11-12</b>	<b>12-13</b>
Upgrade the telephone and public address systems to provide effective communications both within and outside the school.			X
Continue districts technology equipment replacement plan.	X	X	X
Continue network copier-laser printer initiative to minimize inkjet printer use, thereby, maximizing financial efficiencies.	X	X	X
Continue acquisition of classroom technologies, including digital projectors, “Smart Boards”, DVD players, televisions, listening stations, audio devices, graphing calculators and scientific equipment to support instruction.	X	X	X
Continue acquisition adaptive hardware to insure access to the curriculum for all students.	X	X	X
Continue to maintain current online IT support and asset management application.	X	X	X

**3. Administration**

<b>Goal</b>	<b>10-11</b>	<b>11-12</b>	<b>12-13</b>
Each school within the district will maintain adequate levels of technology staff to support the district’s curriculum and instruction.	X	X	X
Continue to maintain a web based email system for all staff in addition to implement public record e-mail archiving to adhere to the Public Records Law	X	X	X
Continue to maintain and develop efficiencies within the Student Information Management systems, data collection systems, DOE reporting systems, community outreach vehicles and financial reporting systems.	X	X	X
Continue to maintain the student interface for the Food Service payment and data system.	X	X	X
Continue to provide web environments for classroom teachers, building administration, and district administration to enhance student learning and community outreach.	X	X	X

**4. Software Acquisition**

<b>Goal</b>	<b>10-11</b>	<b>11-12</b>	<b>12-13</b>
Maintain network management applications.	X	X	X
Continue to purchase appropriate instructional software titles, online educational environment subscriptions, and ASP services to support curriculum and instruction in grades Pre K-12.	X	X	X
Continue to provide software to support assistive technologies.	X	X	X
Continue applicable test preparation software. Implement and expand at all levels	X	X	X

**5. Professional Development**

<b>Goal</b>	<b>10-11</b>	<b>11-12</b>	<b>12-13</b>
Conduct assessment of teacher technology competencies utilizing the Massachusetts Technology Self Assessment Tool.	X	X	X
Provide training for all staff in specialized technology: Case-E and Assistive Technologies, digital cameras, multimedia projectors, Flip Camera, PDA's, graphing calculators, Smartboard	X	X	X
Provide training for all staff in administrative technology: I-Pass training, Data Warehouse, file management.	X	X	X
Provide training for all staff in basic computer technology: trouble shooting computer and printing problems, e-mail, word processing, file management, spreadsheets/excel, and basic computer operations.	X	X	X
Provide training for all staff in presentation technology: graphics (clip-art, drawing software), desktop publishing, presentation/power-point, and Smartboard, Wiki, Blogging, Teacher Websites.	X	X	X
Provide training for all staff on the ethical use of technology including issues such as copyright and plagiarism.	X	X	X

**6. Student Outcomes**

<b>Goal</b>	<b>10-11</b>	<b>11-12</b>	<b>12-13</b>
Continue learning and achievement will be heightened by incorporating technology into the core curriculum.	X	X	X
Students will attain competencies consistent with the Massachusetts Instructional Technology Standards.	X	X	X
Students will engage in integration activities consistent with the Massachusetts Instructional Technology Standards and Massachusetts Curriculum Frameworks.	X	X	X
Students will be provided with the necessary skills to acquire, interpret, analyze, and communicate information and new ideas through the use of technology.	X	X	X
Students will comprehend and demonstrate the ethical use of technology.	X	X	X
Students will develop proficiency accessing information.	X	X	X
All students should be proficient in keyboarding as it applies to their grade.	X	X	X

- B. The district has a technology team with representatives from a variety of stakeholder groups. The technology team has the support of the district leadership team.**

**Technology Team:**

George Zini	Superintendent of Schools, Administration
Don Sawyer	Business Administrator, Director of Technology, Administration
Patrick Mistler	Assistant Director of Technology
Mike DiMeglio	Dean of Students, Technology Department Head, High School
Amy Puliafico	Assistant Principal, Middle School
Tara Bennett	Principal, High School
Dr. Paul Haughey	Director of Pupil Personnel, Administration

**C. Budget**

**1. The district has a budget for its local technology plan with line items for technology in its operational budget.**

The Uxbridge Public Schools has provided a line-item budget for the 2010 - 2013 school years.

<b>Account</b>	<b>FY 2010</b>
Technology Staff:	
– Elementary School	\$21,814 (1 FTE)
– Middle School	\$60,562 (1 FTE)
– High School	\$51,398 (1 FTE)
Administration: Technology Director	\$12,000 (.15 FTE)
1 – Technicians	\$36,000 (1.0 FTE)
1 – Data Processing Manager	\$16,000 (.40 FTE)
1 – Website Administrator	\$8,000 (.20 FTE)
1 – Network Support Technician	\$21,639 (.5 FTE)
Maintenance:	
Academic	\$72,000
Data Processing	\$6,000
Software:	
Academic	\$31,300
Data Processing	\$12,000
Supplies	
Academic	\$77,900
Data Processing	\$12,000
Technology Equipment	
Academic	\$132,000
Data Processing	\$6,400
Internet	
Academic	\$17,600
Data Processing	\$4,400

School Computer Supplies

Early Learning Center	Taft Elementary	Whitin Middle School	Uxbridge High School	Central Office
\$1,500	\$3,700	\$6,000	\$20,861	\$15,000

**2. The budget includes staffing, hardware, software, professional development, support, and contracted services.**

The Uxbridge Public Schools budget includes funding for (6.75) FTE Technology related teachers, a Technology Director, a Technician, and a Data Processing Manager with two support persons devoted to system operational support. Other technology related funding (hardware, software, professional development support and contracted services) is proposed on an annual basis with final determination made according to available resources.

**3. The district leverages the use of federal, state, and private resources.**

Historically the Uxbridge Public Schools has been the recipient of a variety of Federal, State, and Private resources to help support technology integration in the schools. These have included Title II-D grants, Universal Service – E-rate reimbursement grants, Town Selectmen/Uxbridge Plan grants, Uxbridge Partners for Education grants and grants for Uxbridge Public Schools Business supporters. Most recently these grants have been used for improvements of the network infrastructure, graphing calculators, and professional development. E-rate funds have been used to subsidize Internet access, telecommunications and staff. It is our goal to continue seeking e-rate funds to leverage the further integration of technology into the instructional program. Uxbridge is currently able to access E-rate grants for internet access and telecommunications. In the future should Uxbridge become eligible, it will also apply for internal connections. Uxbridge will continue to seek appropriate grants and leverage opportunities whenever possible.

**D. Evaluation**

**1. The district evaluates the effectiveness of technology resources toward attainment of educational goals on a regular basis. Prior to purchasing the district assesses the products and services that are needed to improve teaching and learning.**

The Uxbridge Public Schools monitor and update the data inventory on its computer related hardware in order to best deploy available resources to meet educational goals and improve student learning. Prior to any procurement we continue to evaluate specific academic needs. Teacher, Administration, and Technology personnel all play an integral part in the evaluation process.

**2. The district's technology plan includes an evaluation process that enables 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-Wide Technology Committee will continue to meet periodically in order to evaluate current progress and make adjustment in the achievement of goals as needed.

## Massachusetts Department of Education Benchmark 2

### Technology Integration

#### A. Teacher and Student Use of Technology

##### 1. (a) Outside the Classroom

**At least 85% of teachers use technology everyday, including some of the following areas: lesson planning, administrative tasks, communications, and collaboration. Teachers share information about technology uses with their colleagues.**

##### (b) Within the Classroom

**At least 85% of teachers use technology appropriately with students each week, including some of the following areas: research, multimedia, simulations, data interpretation, communications, and collaboration.**

Daily use of technology by many teachers including: lesson planning, research, communication with colleagues and parents, curriculum development, and collaboration.

##### 2. **At least 85% of students from grades 5 to 8 show proficiency in all the Massachusetts Recommended PreK-12 Instructional Technology Standards for Grades 5 to 8.**

Teachers continue to use technology within their classroom, computer labs and libraries to facilitate research, power point, simulations, Smart Boards, and data interpretation.

##### 3. **100% of teachers are working to meet the proficiency level in technology, and by the school year 2010-2011, 75% of teachers will have reached the proficiency level as defined by the Massachusetts Technology Self-Assessment Tool (TSAT).**

Uxbridge will continue working towards the attainment of Teacher Technology Proficiencies at all grade levels.

##### 4. **The district has a CIPA -compliant Acceptable Use Policy (AUP) regarding Internet use.**

Uxbridge's C.I.P.A. compliant Acceptable Use Policy is posted on the Uxbridge Public Schools web site, and is included in all Student Handbooks.

**B. Staffing**

- 1. The district has a full-time equivalent (FTE) district-level technology director/coordinator.**
- 2. The district provides one FTE instructional technology teacher per 40-80 instructional staff.**
- 3. The district has one FTE person dedicated to data management and assessment.**

The Uxbridge Public Schools FY10 Technology related staff includes:

<b>FTE</b>	<b>Title</b>
.15	Technology Director
.5	Network Technician
.40	Data Processing Manager
.20	Website Administrator
1.0	Elementary Computer Technology Teacher
1.0	Middle School Computer Technology Teacher
1.0	High School Computer Technology Teacher
1.0	Support/ Services Technicians

In addition to District technology staff, the District utilizes technology support services from outside vendors and maintains an annual budget for such service.

## **Massachusetts Department of Education Benchmark 3**

### **Technology Professional Development**

**A. By the end of the school year 2010-2011, at least 85% of district staff will have participated in 45 hours of high-quality technology professional development covering technology skills and the integration of technology into instruction.**

Professional Development in technology continues to be offered annually. Trainings have been conducted and will continue to be offered in the following areas: Word, Excel, PowerPoint, Access, E-Mail, Web Page Design, Data Warehouse, Case-E, I-Pass Grading/Student Management Software, Citrix/Vadar, SmartBoard Hardware/Software, SIMS, EPIMS, Study Island, Dora, Wiki, SRI, Flip Video, and various subject related content areas as the need presents itself.

Professional development is available from numerous sources including:

- Uxbridge Public Schools
- MSB Services
- MESPA
- MASSONE
- Massachusetts DESE
- Web-based offerings
- Let's go Learn (DORA, DOMA)
- Massachusetts Insight AP grant

Training is offered when new technologies are brought into the District as appropriate for education and student learning.

**B. Technology professional development is sustained and ongoing and includes coaching, modeling best practices, district-based mentoring, and study groups. The professional development includes concepts of universal design and scientifically based researched models.**

Professional development has been implemented via:

- Technology professional development workshops and courses
- SmartBoard Hardware & Software Training
- Grade Book Training through IPass
- Elementary DORA Reading software training
- Elementary DOMA Math software training

- Middle School Study Island software training
- Case-E training

**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. The Department, the Educational Technology Advisory Council and stakeholders will review the levels of competencies in the Massachusetts Technology Self-Assessment Tool on an annual basis.**

All teachers are surveyed annually with regards to their Professional Development needs. In-service courses and workshops are developed based on the results of the survey. Additionally, teachers are surveyed with the Department of Elementary and Secondary Education Technology Self Assessment Tool.

## Massachusetts Department of Education Benchmark 4

### Accessibility of Technology

#### A. Students per Instructional Computer

**1. The district has an average ratio of fewer than five students per high-capacity, Internet-connected computer. The Department will work with stakeholders to review the capacity of the computer on an annual basis. (The ultimate goal is to have a one-to-one, high-capacity, Internet-connected computer ratio.)**

The District's goal is to provide approximately one hundred high capacity internet connected computers yearly. Obtainment of the District's goal to provide one hundred computers per year is contingent upon the yearly budgetary restraints and allocation of appropriated funds. By achieving this goal, Uxbridge Public Schools will maintain compliance with the State recommended computer to student ratio.

**2. The district considers students' access to portable and/or handheld electronic devices appropriate to their grade level.**

Uxbridge High School utilizes hand held calculators in our math and science classes. The availability of Alpha Smarts are also provided to meet the students' needs at the High School level as well as in the Middle School.

Taft Elementary School currently provides Alpha Smart technology on portable carts for its students and teachers to expand upon the writing process.

**3. The district has established a computer replacement cycle of three/six years or less.**

The Uxbridge Public Schools has set a goal of replacing computers in a four (4) year cycle.

Based on the March 4, 2010 Department of Education Technology Report, the Uxbridge Public Schools have the following student to computer ratios.

Type A	40.45
Type A/B	58.73
Any Type (A/B/C)	.82

Achievement of the goal to replace 100 computers annually will significantly improve the Type-A high capacity computer ratio consistent with the Massachusetts Benchmarks of a 1:5 ratio.

**Computers for Use By Students/Instruction  
As of March 4, 2010**

Computers for Use By Students/Instruction	A	B	C	TOTAL
Early Learning Center	6	5	0	11
Taft Elementary School	123	29	0	152
Whitin Middle School	90	40	0	130
Uxbridge High School	103	83	0	186
<b>TOTALS</b>	322	157	0	479

**B. Technical Support**

- 1. The district makes a commitment 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.**
- 2. The district provides a 1.0 FTE network support technician along with outside service vendors.**
- 3. The district provides at least 1.0 FTE person to support 100-200 computers. Technical support can be provided by dedicated staff or contracted services.**

The District utilizes an online .ASP technical support system. Each District Staff Member uses individual secured portals to request technical support and track status of work orders. Staff support requests are automatically delegated to the applicable tech support personnel via online systems increasing process flow efficiency and expediting technical support. The system maintains real time status on all new, assigned, open, and completed work orders while providing Administrators with reporting, trends, and technology equipment asset management.

## **Massachusetts Department of Education Benchmark 5**

### **Infrastructure for Connectivity**

#### **A. Internet Access**

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

**2. The district provides bandwidth of at least 10/100 MB to each classroom.**

All classrooms in all schools are connected to the Internet via the school networks and the District has a 100 MB fiber loop network with a central distribution point to its Internet Service Provider – Charter Communications. All classroom cabling can support a minimum 10/100 MB switched network.

#### **B. Networking (LAN/WAN)**

**1. The district provides a minimum 10/100 MB Cat 5 switched network and/or 802.11b/g wireless network.**

All computers are connected to a minimum 10/100 MB Cat 5 uplink switched network. As we implement our Technology goals, we hope to install equipment that will allow us to surpass our current capabilities.

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

E-mail and web publishing services are provided in-house in conjunction with the Celt Corporation and Teacherweb.com.

#### **C. E-Learning Environments**

**1. The district encourages the development and use of innovative strategies for delivering specialized courses through the use of technology.**

**2. Classroom applications of e-learning include courses, cultural projects, virtual field trips, etc.**

Teachers are offered an online subscription to Discovery Learning which provides the ability to enhance their curriculum through video, audio and online quizzes.

Technology is also provided for classrooms to video-skype which broadens the spectrum of their learning experience.

Teachers are offered an online subscription to BrainPop which provides multimedia lessons on all content area topics.

Teachers are offered an online subscription to Study Island which provides an online assessment tool as well as lessons connected directly to the Massachusetts frameworks.



## **Massachusetts Department of Education Benchmark 6**

### **Access to the Internet outside the School Day**

#### **A. The district maintains an up-to-date web site that includes information for parents.**

The Uxbridge Public Schools web-site [www.uxbridgeschools.com](http://www.uxbridgeschools.com) is updated regularly. Information includes monthly school newsletters and notices, directory information, student handbooks, program of study for the high school, student health information and forms, library links, Federal and State non-discrimination statements, District and School profiles, School “Report Cards”, District Technology Plans, and links to community organizations.

#### **B. The district works with community groups to ensure that students and staff have access to the Internet outside of the school day.**

The District provides Internet access outside the school day. The high school and middle school have access before and after the regular school day. At the Elementary level, technology access is provided through specialized enrichment or after-school activities and extra-help opportunities. The Uxbridge Public Library has Internet access available to students and staff after school and on weekends. Adult Education courses are offered regularly on evenings to provide further development of skills.

#### **C. The district web site includes an up-to-date list of places where students and staff can access the Internet after school hours.**

Students and staff can access the Internet in any of our buildings after school hours, and at our town library. This information is posted on our web site.

## GOAL ASSESSMENT – YEAR 1 2010 – 2011

	<b>Goal</b>	<b>Comp.</b>
<b>Goal 1: Infrastructure/ Network</b>	Continue to convert all hubs to switches and upgrade building network cabling in order to maximize network speeds and internet connectivity.	In - Process
Goal 1: I and N	Maintain the network with current anti-virus and spyware protection and continue to upgrade to the latest versions available.	Yes
Goal 1: I and N	Maintain CIPA compliant filtering in all schools.	Yes
Goal 1: I and N	Deploy centralized network operation center connecting all school facilities via wide-area network. The NOC will provide centralized technology support, increased student information management systems, and enhanced online learning environments, academic file storage for teacher and student use, and economy of scale financial benefits. This system will ensure accessibility from remote locations.	Yes
Goal 1: I and N	Replace current backup systems with a centralized tape less backup system.	Yes
Goal 1: I and N	Continue to maintain current online IT support and asset management application.	Yes
Goal 1: I and N	Continue District’s technology equipment replacement plan.	Yes
Goal 1: I and N	Build wireless capabilities in each building, as required by curriculum and instruction.	In Process

Goal 1: I and N	Upgrade District's current technology disaster recovery plan to include future enhancements to network and infrastructure.	Yes
<b>Goal 2: Hardware</b>	Continue District's technology equipment replacement plan	Yes
Goal 2: Hardware	Continue network copier-laser printer initiative to minimize inkjet printer use, thereby, maximizing financial efficiencies.	Yes
Goal 2: Hardware	Continue acquisition of classroom technologies, including digital projectors, "Smart Boards", DVD players, televisions, listening stations, audio devices, graphing calculators and scientific equipment to support instruction.	Yes
Goal 2: Hardware	Continue acquisition of adaptive hardware to insure access to the curriculum for all students.	Yes
Goal 2: Hardware	Continue to maintain current online IT support and asset management application.	Yes
<b>Goal 3: Administration</b>	Each school within the District will maintain adequate levels of technology staff to support the District's curriculum and instruction.	Yes
Goal 3: Admin.	Continue to maintain a web based email system for all staff in addition to implement public record email archiving to adhere to the Public Records Law.	Yes
Goal 3: Admin.	Continue to maintain and develop efficiencies within the Student Information Management systems, data collection systems, DOE reporting systems, community outreach vehicles and financial reporting systems.	Yes
Goal 3: Admin.	Continue to maintain the student interface for the Food Service payment and data system.	Yes

Goal 3: Admin.	Continue to provide web environments for classroom teachers, building administration, and district administration to enhance student learning and community outreach.	Yes
<b>Goal 4: Software Application</b>	Acquire and maintain network management applications.	Yes
Goal 4 Soft. Appl.	Continue to purchase appropriate instructional software titles, online educational environment subscriptions, and ASP services to support curriculum and instruction in grades Pre K-12.	Yes
Goal 4 Soft. Appl.	Continue to provide software to support assistive technologies.	Yes
Goal 4 Soft. Appl.	Acquire applicable test preparation software.	Yes
<b>Goal 5: Professional Development</b>	Conduct assessment of teacher technology competencies utilizing the Massachusetts Technology Self Assessment Tool.	Yes
Goal 5: Prof. Dev.	Provide training for all staff in specialized technology: Case-E and Assistive Technologies, digital cameras, multimedia projectors, videodiscs, PDA's, graphing calculators, Smartboard.	Yes
Goal 5: Prof. Dev.	Provide training for all staff in administrative technology: I-Pass training, file management.	Yes
Goal 5: Prof. Dev.	Provide training for all staff in basic computer technology: trouble shooting computer and printing problems, e-mail, word processing, file management, spreadsheets/excel, and basic computer operations.	Yes
Goal 5: Prof. Dev.	Provide training for all staff in presentation technology: graphics (clip-art, drawing software), desktop publishing, presentation/power-point, and Smartboard.	Yes

Goal 5: Prof. Dev.	Provide training for all staff on the ethical use of technology including issues such as copyright and plagiarism.	Yes
<b>Goal 6: Student Outcomes</b>	Student learning and achievement will be heightened by incorporating technology into the core curriculum.	In Process
Goal 6: S. O.	Students will attain competencies consistent with the Massachusetts Instructional Technology Standards.	In Process
Goal 6: S. O.	Students will engage in integration activities consistent with the Massachusetts Instructional Technology Standards and Massachusetts Curriculum Frameworks.	In Process
Goal 6: S. O.	Students will be provided with the necessary skills to acquire, interpret, analyze, and communicate information and new ideas through the use of technology.	In Process
Goal 6: S. O.	Students will comprehend and demonstrate the ethical use of technology.	In Process
Goal 6: S. O.	Students will develop proficiency accessing information.	Yes
Goal 6: S. O.	All students should be proficient in keyboarding as it applies to their grade.	Yes

## GOAL ASSESSMENT – YEAR 2 2011 – 2012

	Goal	Comp.
<b>Goal 1: Infrastructure/ Network</b>	Continue to convert all hubs to switches and upgrade building network cabling in order to maximize network speeds and internet connectivity.	
Goal 1: I and N	Maintain the network with current anti-virus and spyware protection and continue to upgrade to the latest versions available.	
Goal 1: I and N	Maintain CIPA compliant filtering in all schools.	
Goal 1: I and N	Deploy centralized network operation center connecting all school facilities via wide-area network. The NOC will provide centralized technology support, increased student information management systems, and enhanced online learning environments, academic file storage for teacher and student use, and economy of scale financial benefits. This system will ensure accessibility from remote locations.	
Goal 1: I and N	Continue to maintain current online IT support and asset management application.	
Goal 1: I and N	Continue District's technology equipment replacement plan.	
Goal 1: I and N	Build wireless capabilities in each building, as required by curriculum and instruction.	
Goal 1: I and N	Upgrade District's current technology disaster recovery plan to include future enhancements to network and infrastructure.	
<b>Goal 2: Hardware</b>	Continue District's technology equipment	

	replacement plan	
Goal 2: Hardware	Continue network copier-laser printer initiative to minimize inkjet printer use, thereby, maximizing financial efficiencies.	
Goal 2: Hardware	Continue acquisition of classroom technologies, including digital projectors, “Smart Boards”, DVD players, televisions, listening stations, audio devices, graphing calculators and scientific equipment to support instruction.	
Goal 2: Hardware	Continue acquisition of adaptive hardware to insure access to the curriculum for all students.	
Goal 2: Hardware	Continue to maintain current online IT support and asset management application.	
<b>Goal 3: Administration</b>	Each school within the District will maintain adequate levels of technology staff to support the District’s curriculum and instruction.	
Goal 3: Admin.	Continue to maintain a web based email system for all staff in addition to implement public record email archiving to adhere to the Public Records Law.	
Goal 3: Admin.	Continue to maintain and develop efficiencies within the Student Information Management systems, data collection systems, DOE reporting systems, community outreach vehicles and financial reporting systems.	
Goal 3: Admin.	Continue to maintain the student interface for the Food Service payment and data system.	
Goal 3: Admin.	Continue to provide web environments for classroom teachers, building administration, and district administration to enhance student learning and community outreach.	

<b>Goal 4: Software Application</b>	Acquire and maintain network management applications.	
Goal 4 Soft. Appl.	Continue to purchase appropriate instructional software titles, online educational environment subscriptions, and ASP services to support curriculum and instruction in grades Pre K-12.	
Goal 4 Soft. Appl.	Continue to provide software to support assistive technologies.	
Goal 4 Soft. Appl.	Acquire applicable test preparation software.	
<b>Goal 5: Professional Development</b>	Conduct assessment of teacher technology competencies utilizing the Massachusetts Technology Self Assessment Tool.	
Goal 5: Prof. Dev.	Provide training for all staff in specialized technology: Case-E and Assistive Technologies, digital cameras, multimedia projectors, videodiscs, PDA's, graphing calculators, Smartboard.	
Goal 5: Prof. Dev.	Provide training for all staff in administrative technology: Test Wiz, I-Pass training, file management.	
Goal 5: Prof. Dev.	Provide training for all staff in basic computer technology: trouble shooting computer and printing problems, e-mail, word processing, file management, spreadsheets/excel, and basic computer operations.	



Goal 5: Prof. Dev.	Provide training for all staff in presentation technology: graphics (clip-art, drawing software), desktop publishing, presentation/power-point, and Smartboard.	
Goal 5: Prof. Dev.	Provide training for all staff on the ethical use of technology including issues such as copyright and plagiarism.	
<b>Goal 6: Student Outcomes</b>	Student learning and achievement will be heightened by incorporating technology into the core curriculum.	
Goal 6: S. O.	Students will attain competencies consistent with the Massachusetts Instructional Technology Standards.	
Goal 6: S. O.	Students will engage in integration activities consistent with the Massachusetts Instructional Technology Standards and Massachusetts Curriculum Frameworks.	
Goal 6: S. O.	Students will be provided with the necessary skills to acquire, interpret, analyze, and communicate information and new ideas through the use of technology.	
Goal 6: S. O.	Students will comprehend and demonstrate the ethical use of technology.	
Goal 6: S. O.	Students will develop proficiency accessing information.	
Goal 6: S. O.	All students should be proficient in keyboarding as it applies to their grade.	

## GOAL ASSESSMENT – YEAR 3 2012 – 2013

	<b>Goal</b>	<b>Comp.</b>
<b>Goal 1: Infrastructure/ Network</b>	Continue to convert all hubs to switches and upgrade building network cabling in order to maximize network speeds and internet connectivity.	
Goal 1: I and N	Maintain the network with current anti-virus and spyware protection and continue to upgrade to the latest versions available.	
Goal 1: I and N	Maintain CIPA compliant filtering in all schools.	
Goal 1: I and N	Deploy centralized network operation center connecting all school facilities via wide-area network. The NOC will provide centralized technology support, increased student information management systems, and enhanced online learning environments, academic file storage for teacher and student use, and economy of scale financial benefits. This system will ensure accessibility from remote locations.	
Goal 1: I and N	Continue to maintain current online IT support and asset management application.	
Goal 1: I and N	Continue District's technology equipment replacement plan.	
Goal 1: I and N	Build wireless capabilities in each building, as required by curriculum and instruction.	
Goal 1: I and N	Upgrade District's current technology disaster recovery plan to include future enhancements to network and infrastructure.	
<b>Goal 2: Hardware</b>	Upgrade the telephone and public address systems	

	to provide effective communications both within and outside the school.	
Goal 2: Hardware	Continue District's technology equipment replacement plan	
Goal 2: Hardware	Continue network copier-laser printer initiative to minimize inkjet printer use, thereby, maximizing financial efficiencies.	
Goal 2: Hardware	Continue acquisition of classroom technologies, including digital projectors, "Smart Boards", DVD players, televisions, listening stations, audio devices, graphing calculators and scientific equipment to support instruction.	

Goal 2: Hardware	Continue acquisition of adaptive hardware to insure access to the curriculum for all students.	
Goal 2: Hardware	Continue to maintain current online IT support and asset management application.	
<b>Goal 3: Administration</b>	Each school within the District will maintain adequate levels of technology staff to support the District's curriculum and instruction.	
Goal 3: Admin.	Continue to maintain a web based email system for all staff in addition to implement public record email archiving to adhere to the Public Records Law.	
Goal 3: Admin.	Continue to maintain and develop efficiencies within the Student Information Management systems, data collection systems, DOE reporting systems, community outreach vehicles and financial reporting systems.	
Goal 3: Admin.	Continue to maintain the student interface for the Food Service payment and data system.	
Goal 3: Admin.	Continue to provide web environments for classroom teachers, building administration, and district administration to enhance student learning and community outreach.	
<b>Goal 4: Software Application</b>	Acquire and maintain network management applications.	
Goal 4 Soft. Appl.	Continue to purchase appropriate instructional software titles, online educational environment subscriptions, and ASP services to support curriculum and instruction in grades Pre K-12.	
Goal 4 Soft. Appl.	Continue to provide software to support assistive technologies.	

Goal 4 Soft. Appl.	Acquire applicable test preparation software.	
<b>Goal 5: Professional Development</b>	Conduct assessment of teacher technology competencies utilizing the Massachusetts Technology Self Assessment Tool.	
Goal 5: Prof. Dev.	Provide training for all staff in specialized technology: Case-E and Assistive Technologies, digital cameras, multimedia projectors, videodiscs, PDA's, graphing calculators, Smartboard.	
Goal 5: Prof. Dev.	Provide training for all staff in administrative technology: Test Wiz, I-Pass training, file management.	

Goal 5: Prof. Dev.	Provide training for all staff in basic computer technology: trouble shooting computer and printing problems, e-mail, word processing, file management, spreadsheets/excel, and basic computer operations.	
Goal 5: Prof. Dev.	Provide training for all staff in presentation technology: graphics (clip-art, drawing software), desktop publishing, presentation/power-point, and Smartboard.	
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Goal 6: S. O.	Students will develop proficiency accessing information.	
Goal 6: S. O.	All students should be proficient in keyboarding as	

	it applies to their grade.	
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## **Appendix**

**A. Proposed Uxbridge Public Schools Acceptable Use Policy**

**B. Proposed Employee Telecom Policy**

**C. Massachusetts Recommended PreK-12 Instructional Technology Standards**

**D. Uxbridge Public School Instructional Technology Standards Benchmarks**



## **APPENDIX A – PROPOSED UXBRIDGE PUBLIC SCHOOLS ACCEPTABLE USE POLICY**

Uxbridge Public Schools Technology Plan  
Uxbridge School Committee Policies  
UXBRIDGE PUBLIC SCHOOLS  
TECHNOLOGY USE

### **Purpose**

The Uxbridge Public Schools shall provide access for employees and students to the networking, including access to external networks, for limited educational purposes. Educational purposes shall be defined as classroom activities, career and professional development, and high quality self discovery activities of an educational nature. The purpose of the networking is to assist in preparing students for success in life and work by providing access to a wide range of information and the ability to communicate with others. The networking will be used to increase communication (staff, parent, and student), enhance productivity, and assist staff in upgrading existing skills and acquiring new skills through a broader exchange of information. The networking will also be utilized to provide information to the community, including parents, governmental agencies, and businesses.

### **Availability**

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

Access to the networking, including external networks, shall be made Available to employees, students, and townspeople (when available) for Instructional and administrative purposes and in accordance with Administrative regulations and procedures.

Access to the networking is a privilege, not a right. All users shall be required to acknowledge receipt and understanding of all administrative regulations and procedures governing use of the system and shall agree in writing to comply with such regulations and procedures. Noncompliance with applicable regulations and procedures may result in suspension or termination of user privileges and other disciplinary actions consistent with the policies of the Uxbridge Public Schools. Violations of law may result in criminal prosecution as well as disciplinary action by the Uxbridge Public Schools.

### **Acceptable Use**

The superintendent, or designee, shall develop and implement administrative regulations, procedures, and user agreements, consistent with the purposes and mission of the Uxbridge Public Schools as well as the law and policy governing copyright.

### **Monitored Use**

Electronic mail transmissions and other use of electronic resources by students and employees shall not be considered confidential and may be monitored at any time by designated staff to ensure appropriate use for instructional and administrative purposes.

### **Liability**

The Uxbridge Public Schools shall not be liable for users' inappropriate use of electronic resources or violations of copyright restrictions, users' mistakes or negligence, or costs incurred by users. The Uxbridge Public Schools shall not be responsible for ensuring the accuracy or usability of any information found on external networks.



## **Uxbridge Public Schools**

### *School Network and Internet Use Agreement*

#### **Student**

I have read, understand and will abide by the attached School Network and Internet Use Agreement. I further understand that any violation of the attached regulations is unethical and may constitute a criminal offense. Should I commit any violation, my access privileges may be revoked, school disciplinary action may be taken, and/or appropriate legal action.

Student's Name (please print): \_\_\_\_\_

Student's Signature: \_\_\_\_\_ Date \_\_\_\_\_

#### **Parent or Guardian**

(If you are under the age of 18 a parent or guardian must also read and sign this agreement.)

As the parent or guardian of this student, I have read the School Network and Internet Use Agreement. I understand that this access is designed for educational purposes. The Uxbridge Public Schools will make every reasonable effort to ensure the Internet is used responsibly and will take every reasonable step to control access to inappropriate material. I recognize it is impossible for Uxbridge Public Schools to restrict access to all controversial materials and I will not hold them responsible for materials acquired on the network. Further, I accept full responsibility for supervision if and when my child's use is not in a school setting. I hereby give permission to grant access to the Internet for my child and certify that the information contained on this form is correct.

Parent or Guardian's Name (please print): \_\_\_\_\_

Signature: \_\_\_\_\_ Date \_\_\_\_\_

*The complete Uxbridge Acceptable Use Agreement for School Network and Internet is available on the web at [www.uxbridgeschools.com](http://www.uxbridgeschools.com).*

## **APPENDIX B – PROPOSED EMPLOYEE TELECOM POLICY**

### **Staff use of district technology, electronic mail and internet services**

The intent of these regulations is to provide administrators, teachers, staff, and other users under the supervision of an employee (e.g., parent volunteers) with procedures for utilizing the district’s computers, networks, and internet services. The regulations may be supplemented by more specific administrative procedures governing day-to-day management and operation of the computers, network, and the internet.

These regulations provide examples of prohibited uses for illustrative purposes, but do not attempt to state all required or prohibited activities by users. Individuals who have questions regarding whether a particular activity or use is acceptable should seek approval from their supervisor.

Failure to comply with these regulations, and/or other established administrative procedures governing computer, network, and internet use is unethical and may constitute a criminal or civil violation. Violations of regulations may result in a revocation of access privileges, disciplinary action, and/or appropriate legal action. Illegal uses of the district’s computers will result in referral to law enforcement authorities.

#### **A. Acceptable Use**

Administrator, teacher, staff, and other users under the supervision of an employee access to the district’s computers, networks, and internet services is provided for administrative, educational, communication, and research purposes consistent with the district’s educational mission, curriculum, and instructional goals. General rules and expectations for professional behavior and communication apply to use of the district’s computers, networks, and internet services.

Administrators, teachers, staff, and other users under the supervision of an employee are to utilize the district’s computers, networks, and internet services for school-related purposes and performance of job duties. The confidentiality of information stored in or created, received or sent over the e-mail system, or through internet access cannot be guaranteed.

Employees are not permitted to bring personal computer equipment in to the districts network without prior approval of the districts network team.

Individuals are reminded that such personal use must comply with this policy and all other applicable policies, regulations, and administrative procedures.

## **B. Prohibited Use**

Administrators, teachers, staff, and other users under the supervision of an employee are responsible for their actions and activities involving district computers, networks, and internet services and for their computer files, passwords, and accounts. Unacceptable uses that are expressly prohibited include, but are not limited to, the following:

### **Users shall not:**

1. Access, transmit, or retransmit any material in violation of any u.s. or state law, including, but not limited to, copyrighted material and material protected by trade secret.
2. Access, transmit, or retransmit material regarding students, parents/guardians, or district staff that is protected by confidentiality laws, if material is not legally protected, but is of confidential or sensitive nature, great care shall be taken to ensure that only those with a “need to know” are allowed access to the material.
3. Access, transmit, or retransmit material which is threatening, promotes violence, or advocates destruction of property, including, but not limited to, information concerning the manufacture of destructive devices such as explosives, fireworks, smoke bombs, incendiary devices, or the like.
4. Access, transmit, or retransmit any information containing pornographic, obscene, or other sexually oriented material (pornographic means pictures or writings that are intended to stimulate erotic feelings by the description or portrayal of sexual activity or the nude human form.)
5. Access, transmit, or retransmit material which advocates or promotes violence or hatred against particular individuals or groups of individuals or advocates or promotes the superiority of one racial, ethnic, or religious group over another.
6. Use district computing resources for any commercial activities, such a advertising or selling goods or services, unless it is for legitimate district business.
7. Except for educational or district business purposes, create, transmit, or download any materials that support or oppose the nomination for election of a candidate for public office or the passage of an override or bond issue.
8. Solicit political contributions using district computing resources from any person or entity.
9. Use inappropriate or profane language or access, transmit, or retransmit material likely to be offensive to others in the school community, including sexually harassing material.
10. Use or possess copies of malicious programs or hacking/cracking type programs on any computer systems connected to the district network that could be used to assist in the commission of computer vandalism without written consent of the director of the technology department or their designated alternate representative(s).
11. Use or possess unauthorized or bootleg software (Bootleg software means any software that has been downloaded or is otherwise in the user’s possession without the appropriate registration of the software, including the payment of any fees owing to the owner of the software.)
12. Impersonate another user or transmit or retransmit material anonymously.
13. Transmit or retransmit communication that represents personal views as those of the district or that could be misinterpreted as such.

14. Attempt to establish internet or other external connections that could allow unauthorized persons to gain access to the Uxbridge Public Schools' systems, information, and/or internet services.
15. Use another individual's network account without expressed permission from that individual or modify files, passwords, or data belonging to other users in the district.
16. Destroy, modify, or abuse district-owned technology or disrupt the operation of any network within the district or any network connected to the internet, including the use, attempted use, or possession of computer viruses.
17. Attempt to circumvent the internet filter to gain access to unauthorized or filtered sites without override approval.
18. Fail to stop and/or inform the building principal or supervisor of any violation of the provisions contained herein.

**C. No Expectation of Privacy**

The district retains control, custody, and supervision of all computers, networks, and internet services owned or leased by the district. The district reserves the right to monitor all computer and internet activity by employees and other system users. The district reserves the right to access and disclose, a necessary, all messages sent over its e-mail system, without regard to content. As such, you should not use e-mail to transmit messages you would not want read by a third party. Users have no expectation of privacy in their use of school computers, including e-mail messages and stored files. Use of district technology is a privilege, not a right.

**D. Responsibilities to Students**

Administrators, teachers, staff, and other users under the supervision of an employee who utilize school computers for instructional purposes with students have a duty of care to supervise such use. Teachers and staff members are expected to be familiar with the district's policies and regulations concerning student computer and internet use and to enforce them. When, in the course of their duties, employees become aware of student violations, they shall stop the activity and/or inform the building principal or supervisor.

**E. Compensation for Losses, Costs, and/or Damages**

Administrators, teachers, staff members, and other system users under the supervision of an employee shall be responsible for any losses, costs, or damages incurred by the district related to violations of these regulations, or arising out of, or relation to, any personal use.

**F. District Assumes No Responsibility for Unauthorized Charges, Costs, or Illegal Use**

The district assumes no responsibility for any unauthorized charges made by users, including, but not limited to, credit card charges, subscriptions, or for any illegal use of its computers such as copyright violations.

**G. No District Liability Relating to Any Incidental Personal Use**

The district assumes no liability for any loss arising out of, or relating to, any personal use. The employee assumes all responsibility for any loss.

# 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."<sup>1</sup>

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."<sup>2</sup>

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.<sup>3</sup> 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;

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<sup>1</sup> The announcement is available online at [http://www.21stcenturyskills.org/index.php?option=com\\_content&task=view&id=328&Itemid=64](http://www.21stcenturyskills.org/index.php?option=com_content&task=view&id=328&Itemid=64)

<sup>2</sup> *The Road to 21st Century Learning: A Policymaker's Guide to 21st Century Skills* (2003) is available online at [http://www.21stcenturyskills.org/images/stories/otherdocs/p21up\\_Policy\\_Paper.pdf](http://www.21stcenturyskills.org/images/stories/otherdocs/p21up_Policy_Paper.pdf)

<sup>3</sup> See Appendix C and Appendix D.



- conceptual understandings of the nature and operation of technology systems; and
- learning and adapting to new and emerging technology tools.

***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.

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## *Instructional Technology Standards*

<b>Massachusetts Technology Standards</b>			
<b>Grades K through 2 - Technology Standards and Expectations</b>			
<b>1. Technology Exploratory Skills and Expectations</b>	<b>Grade</b>		
<i>(What students should know and be able to do by grade)</i>	<i>(Continue to address earlier skill as needed. D=Developing M= Master E= Extend)</i>		
<i>1.1 Basic Operations</i>	K	1	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).		<b>D</b>	<b>M</b>
1.2 Explain that icons (e.g., recycle bin/trash, folder) are symbols used to signify a command, file, or application.		<b>D</b>	<b>M</b>
1.3 Identify, locate, and use letters, numbers, and special keys (e.g., space bar, Shift, Delete) on the keyboard.		<b>D</b>	<b>D</b>
1.4 Recognize the functions of basic file menu commands (e.g., New, Open, Close, Save, Print).		<b>D</b>	<b>M</b>
<i>1.5 Word Processing and Desktop Publishing</i>	K	1	2
1.5 Use a word processing application to write, edit, print, and save simple assignments.		<b>D</b>	<b>D</b>
1.6 Insert and size a graphic in a word processing document.		<b>D</b>	<b>D</b>

<i>1.7 Database and Spreadsheet (Tables/Charts and Graphs)</i>	<b>K</b>	<b>1</b>	<b>2</b>
1.7 Explain that computers can store and organize information so that it can be searched.		<b>D</b>	<b>M</b>
1.8 Use a simple computer graphing application to display data.		<b>D</b>	<b>D</b>
<i>1.9 Internet and Multimedia</i>	<b>K</b>	<b>1</b>	<b>2</b>
1.9 Explain that the Internet links computers around the world, allowing people to access information and communicate.		<b>M</b>	<b>E</b>
1.10 Demonstrate the ability to use tools in painting and/or drawing programs.		<b>M</b>	<b>E</b>

<b>Massachusetts Technology Standards</b>	
<b>Grades K through 2 - Exploratory Skills and Expectations</b>	
<b>2. Ethics, Society, and Safety</b>	<b>Grade</b>

<i>(What student should know and be able to do by grade)</i>	<i>(Continue to address earlier skill as needed. D=Developing M= Master E= Extend)</i>		
<i>2.1 Ethics</i>	<b>K</b>	<b>1</b>	<b>2</b>
2.1 Follow classroom rules for the responsible use of computers, peripheral devices, and resources.		<b>D</b>	<b>M</b>
2.2 Explain the importance of giving credit to media creators when using their work in student projects.		<b>D</b>	<b>D</b>
<i>2.2 Classroom/Society</i>	<b>K</b>	<b>1</b>	<b>2</b>
2.3 Explain why there are rules for using technology at home and at school.		<b>D</b>	<b>M</b>
2.4 Identify the purpose of a media message (to inform, persuade, or entertain).		<b>D</b>	<b>D</b>
2.5 Describe how people use many types of technologies in their daily lives.		<b>D</b>	<b>M</b>
<i>2.3 Safety</i>	<b>K</b>	<b>1</b>	<b>2</b>
2.6 Follow the school rules for safe and ethical Internet use. (Use of Internet in this grade span is determined by district policy.)		<b>D</b>	<b>M</b>



2.7 Demonstrate knowledge of ergonomics and electrical safety when using computers.		<b>D</b>	<b>M</b>
2.8 Explain that a password helps protect the privacy of information.		<b>D</b>	<b>D</b>

<b>Massachusetts Technology Standards</b>			
<b>Grades K through 2 - Technology Standards and Expectations</b>			
<b>3. Research, Problem-Solving, and Communications</b> <i>(What student should know and be able to do by grade)</i>	<b>Grade</b> <i>(Continue to address earlier skill as needed. D=Developing M= Master E= Extend)</i>		
<i>3.1 Research (Gathering and Using Information)</i>	<b>K</b>	<b>1</b>	<b>2</b>
3.1 Use various age-appropriate technologies to locate, collect, and organize information.		<b>D</b>	<b>D</b>
3.2 Review teacher-selected Internet resources and explain why each resource is or is not useful.		<b>D</b>	<b>D</b>
<i>3.3 Problem Solving</i>	<b>K</b>	<b>1</b>	<b>2</b>
3.3 Use age-appropriate technologies (e.g., a simple graphing application) to gather and analyze data.		<b>D</b>	<b>D</b>
<i>3.4 Communication</i>	<b>K</b>	<b>1</b>	<b>2</b>
3.4 Use a variety of age-appropriate technologies (e.g., drawing program, presentation software) to communicate and exchange ideas.		<b>D</b>	<b>D</b>



<b>Massachusetts Technology Literacy Standards</b>			
<b>Grades 3 through 5 – Technology Standards and Expectations</b>			
<b>1. Basic Operations and Productivity Tools</b> <i>(What students should know and be able to do by the end of 5th grade)</i>	<b>Grade</b> <i>(Continue to address earlier skill as needed. D=Developing M= Master E= Extend)</i>		
<i>1.1 Basic Operations</i>	<b>3</b>	<b>4</b>	<b>5</b>
1.1 Demonstrate basic steps in using available hardware and applications (e.g., log into a computer, connect/disconnect peripherals, upload files from peripherals).	<b>D</b>	<b>D</b>	<b>M</b>
1.2 Select a printer, use print preview, and print a document with the appropriate page setup and orientation.	<b>D</b>	<b>D</b>	<b>M</b>
1.3 Use various operating system features (e.g., open more than one application/program, work with menus, use the taskbar/dock).	<b>D</b>	<b>D</b>	<b>M</b>
1.4 Demonstrate intermediate <sup>4</sup> keyboarding skills and proper <sup>5</sup> keyboarding techniques.	<b>D</b>	<b>M</b>	<b>M</b>

<b>1.5 Word Processing/Desktop Publishing</b>	<b>3</b>	<b>4</b>	<b>5</b>
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.	D	D	M
1.6 Copy and paste text and images within a document, as well as from one document to another.	D	D	M
1.7 Proofread and edit writing using appropriate resources (e.g., dictionary, spell-checker, grammar resources).	D	D	M
<b>1.8 Database</b>	<b>3</b>	<b>4</b>	<b>5</b>
1.8 Define the term “database” and provide examples from everyday life (e.g., library catalogues, school records, telephone directories).	D	D	D
1.9 Define terms related to databases, such as “record,” “field,” and “search.”	D	D	D
1.10 Do simple searches of existing databases (e.g., online library catalog, electronic encyclopedia).	D	D	M
<b>1.11 Spreadsheet</b>	<b>3</b>	<b>4</b>	<b>5</b>
1.11 Demonstrate an understanding of the spreadsheet as a tool to record, organize, and graph information.	D	D	D
1.12 Identify and explain terms and concepts related to spreadsheets (i.e., cell, column, row, values, labels, chart, graph).	D	D	M

1.13 Enter/edit data in spreadsheets and perform calculations using simple formulas (+, -, *, /), observing the changes that occur.	-	D	M
<i>1.5 Internet, Networking, and Online Communication</i>	<b>3</b>	<b>4</b>	<b>5</b>
1.14 Explain and use age-appropriate online tools and resources (e.g., tutorial, assessment, Web browser).	D	D	D
1.15 Save, retrieve, and delete electronic files on a hard drive or school network.	D	D	M
1.16 Explain terms related to the use of networks (e.g., username, password, network, file server).	D	D	M
1.17 Identify and use terms related to the Internet (e.g., Web browser, URL, keyword, World Wide Web, search engine, links).	D	D	D
1.18 Use age-appropriate Internet-based search engines to locate and extract information, selecting appropriate key words.	D	D	M
<i>1.19 Multimedia and Software Applications</i>	<b>3</b>	<b>4</b>	<b>5</b>
1.19 Create, edit, and format text on a slide.	D	M	M
1.20 Create a series of slides and organize them to present research or convey an idea.	D	M	M
1.21 Copy and paste or import graphics; change their size and position on a	D	M	M

slide.			
1.22 Use painting and drawing applications to create and edit work.	<b>D</b>	<b>M</b>	<b>M</b>

<b>Massachusetts Technology Standards</b>			
<b>Grades 3 through 5 – Technology Standards and Expectations</b>			
<b>2. Ethics, Society and Safety</b> <i>(What students should know and be able to do by the end of 5th grade)</i>	<b>Grade</b> <i>(Continue to address earlier skill as needed. D=Developing M= Master E= Extend)</i>		
<i>2.1 Ethics</i>	<b>3</b>	<b>4</b>	<b>5</b>
2.1 Explain and demonstrate compliance with school rules (Acceptable Use Policy) regarding responsible use of computers and networks.	<b>M</b>	<b>M</b>	<b>D</b>
2.2 Explain responsible uses of technology and digital information; describe possible consequences of inappropriate use.	<b>D</b>	<b>M</b>	<b>D/M</b>
2.3 Explain Fair Use Guidelines for the use of copyrighted materials (e.g., text, images, music, video) in student projects.	<b>D</b>	<b>D</b>	<b>D/M</b>
<i>2.2 Society</i>	<b>3</b>	<b>4</b>	<b>5</b>
2.4 Identify ways in which technology is used in the workplace and in society.	<b>D</b>	<b>D</b>	<b>D</b>
2.5 Work collaboratively online with other students under teacher supervision.	-	<b>D</b>	<b>D</b>
2.6 Analyze media messages and determine if their purpose is to inform, persuade, or entertain.	-	<b>D</b>	<b>D</b>



2.7 Explain that some Web sites and search engines may include sponsored commercial links.	D	D	D
2.8 Explain how hardware and applications can enable people with disabilities to learn.	D	D	D
<b>2.3 Safety</b>	<b>3</b>	<b>4</b>	<b>5</b>
2.9 Recognize and describe the potential risks and dangers associated with various forms of online communications.	D	D	D/ M
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).	D	D	D/ M
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).	-	-	M
2.12 Identify cyber bullying and describe strategies to deal with such a situation.	D	D	D
2.13 Recognize and demonstrate ergonomically sound and safe use of equipment.	D	D	M

**Massachusetts Technology Standards**  
**Grades 3 through 5 – Technology Standards and Expectations**

<b>3. Research, Problem Solving and Communications</b> <i>(What students should know and be able to do by the end of 5th grade)</i>	<b>Grade</b> <i>(Continue to address earlier skill as needed.  D=Developing  M= Master  E= Extend)</i>		
<b>3.1 Research</b>	<b>3</b>	<b>4</b>	<b>5</b>
3.1 Locate, download, and organize content from digital media collections for specific purposes, citing sources.	-	D	D
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.	-	D	M
3.3 Evaluate Internet resources in terms of their usefulness for research.	-	D	D
3.4 Use content-specific technology tools (e.g., environmental probes, sensors, measuring devices, simulations) to gather and analyze data.	-	-	-
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.	-	-	-
<b>3.2 Problem Solving</b>	<b>3</b>	<b>4</b>	<b>5</b>
3.6 With teacher direction, use appropriate technology tools (e.g., graphic organizer) to define problems and propose hypotheses	-	-	D
3.7 Use spreadsheets and other applications to make predictions, solve problems, and draw conclusions.	-	D	D

<i>3.3 Communication</i>	<b>3</b>	<b>4</b>	<b>5</b>
3.8 Create projects that use text and various forms of graphics, audio, and video (with proper citations) to communicate ideas.	<b>D</b>	<b>D</b>	<b>D/ M</b>
3.9 Use teacher-developed guidelines to evaluate multimedia presentations for organization, content, design, presentation, and appropriate use of citations.	<b>D</b>	<b>D</b>	<b>D/ M</b>
3.10 Communicate with other students and other classes using appropriate technology, including e-mail if the district allows it.	-	-	-

<b>Massachusetts Technology Literacy Standards</b>			
<b>Grades 6 through 8 – Technology Standards and Expectations</b>			
<b>1. Basic Operations and Productivity Tools</b> <i>(What students should know and be able to do by the end of 8th grade)</i>	<b>Grade</b> <i>(Continue to address earlier skill as needed. D=Developing M= Master E= Extend)</i>		
<i>1.1 Basic Operations</i>	<b>6</b>	<b>7</b>	<b>8</b>
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).	<b>D</b>	<b>D/ M</b>	<b>M</b>
1.2 Identify successful troubleshooting strategies for minor hardware and software issues/problems (e.g., “frozen screen”).	<b>D</b>	<b>D</b>	<b>D/M</b>
1.3 Independently operate peripheral equipment (e.g., scanner, digital camera, camcorder), if available.	<b>M</b>		
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.	<b>D</b>	<b>M</b>	<b>M</b>
1.5 Demonstrate keyboarding skills between 25-30 wpm with fewer than 5 errors. (For students with disabilities, demonstrate alternate input techniques as appropriate.)	<b>M</b>		
<i>1.6 Word Processing/Desktop Publishing</i>	<b>6</b>	<b>7</b>	<b>8</b>
1.6 Demonstrate use of intermediate features in word processing applications (e.g., tabs, indents, headers and footers, end notes, bullet and numbering, tables).	<b>D/ M</b>	<b>M</b>	<b>M</b>

1.7 Create, save, open, and import a word processing document in different file formats (e.g., RTF, HTML).		<b>D</b>	<b>M</b>
<b>1.8 Database</b>	<b>6</b>	<b>7</b>	<b>8</b>
1.8 Describe the structure and function of a database, using related terms appropriately.			<b>M</b>
1.9 Create a simple database, defining field formats and adding new records.			<b>D/M</b>
1.10 Perform simple operations in a database (i.e., browse, sort, filter, search on selected criteria, delete data, enter data).			<b>D/M</b>
1.11 n and develop database reports to organize and display information.			<b>D</b>
<b>1.12 Spreadsheet</b>	<b>6</b>	<b>7</b>	<b>8</b>
1.12 Describe the use of spreadsheets to calculate, graph, organize, and present data in a variety of real-world settings.	<b>D</b>	<b>M</b>	<b>M</b>
1.13 Create an original spreadsheet, using formulas.	<b>D/ M</b>		
1.14 Use various number formats (e.g., scientific notation, percentages, exponents) as appropriate.	<b>D/ M</b>		
1.15 Produce simple charts and graphs from a spreadsheet.	<b>M</b>		
1.16 Distinguish among different types of charts and graphs, and choose the most appropriate type to represent given data.	<b>D/ M</b>	<b>M</b>	<b>M</b>

1.17 Apply advanced formatting features to customize tables, charts, and graphs.	<b>D</b>	<b>D/ M</b>	<b>D/M</b>
<b>1.18 Internet, Networking, and Online Communication</b>	<b>6</b>	<b>7</b>	<b>8</b>
1.18 Use Web browsing to access information (e.g., enter a URL, access links, create bookmarks/favorites, print Web pages).	<b>D/ M</b>	<b>M</b>	<b>M</b>
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).		<b>M</b>	
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).			<b>D</b>
1.21 Explain and correctly use terms related to online learning (e.g., IP address, post, thread, Intranet, discussion forum, drop box, account, password).			<b>D/M</b>
1.22 Explain that some Web sites require the use of plug-ins and specific browser versions to access content.	<b>D/ M</b>	<b>M</b>	<b>M</b>
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.			<b>M</b>
<b>1.6 Multimedia and Software Applications</b>	<b>6</b>	<b>7</b>	<b>8</b>
1.24 Create a multimedia presentation using various media as appropriate (e.g., audio, video, animations, etc.).	<b>M</b>	<b>M</b>	<b>M</b>

1.25 Use a variety of technology tools (e.g., dictionary, thesaurus, grammar-checker, calculator) to maximize the accuracy of work.	<b>M</b>	<b>M</b>	<b>M</b>
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<b>Massachusetts Technology Standards</b>			
<b>Grades 6 through 8 – Technology Standards and Expectations</b>			
<b>2. Ethics, Society, and Safety</b> <i>(What students should know and be able to do by the end of 8th grade)</i>	<b>Grade</b> <i>(Continue to address earlier skill as needed. D=Developing M= Master E= Extend)</i>		
<i>2.1 Ethics</i>	<b>6</b>	<b>7</b>	<b>8</b>
2.1 Explain ethical issues related to privacy, plagiarism, spam, viruses, hacking, and file sharing.	<b>M</b>	<b>M</b>	<b>M</b>
2.2 Explain how copyright law protects the ownership of intellectual property, and explain possible consequences of violating the law.	<b>M</b>	<b>M</b>	<b>M</b>
2.3 Explain fair use guidelines for using copyrighted materials (e.g., images, music, video, text) in school projects.	<b>M</b>	<b>M</b>	<b>M</b>
2.4 Describe appropriate and responsible use of communication tools (e.g., chats, instant messaging, blogs, and wikis).	<b>D/ M</b>	<b>D/ M</b>	<b>M</b>
<i>2.5 Society</i>	<b>6</b>	<b>7</b>	<b>8</b>
2.5 Identify and discuss the technology proficiencies needed in the workplace, as well as ways to prepare to meet these demands.	<b>M</b>		

2.6 Identify and describe the effect technological changes have had on society.	<b>M</b>		
2.7 Explain how technology can support communication and collaboration, personal and professional productivity, and lifelong learning.	<b>M</b>		
2.8 Analyze and explain how media and technology can be used to distort, exaggerate, and misrepresent information.		<b>M</b>	
2. Give examples of hardware and applications that enable people with disabilities to use technology.	<b>D</b>		
<b>2.10 Safety</b>	<b>6</b>	<b>7</b>	<b>8</b>
2.10 Explain the potential risks associated with the use of networked digital information (e.g., Internet, mobile phones, wireless, LANs).	<b>M</b>	<b>M</b>	<b>M</b>
2.11 Provide examples of safe and unsafe practices for sharing personal information via e-mail and the Internet.	<b>M</b>	<b>M</b>	<b>M</b>
2.12 Explain why computers, networks, and information need to be protected from viruses, intrusion, and vandalism.	<b>D/ M</b>	<b>M</b>	<b>M</b>
2.13 Explain terms associated with the safe, effective, and efficient use of telecommunications/Internet (e.g., password, firewalls, spam, security, Acceptable Use Policy).	<b>D/ M</b>	<b>M</b>	<b>M</b>
2.14 Describe how cyber bullying can be blocked.	<b>D</b>	<b>D</b>	<b>D</b>



<b>Massachusetts Technology Standards</b>			
<b>Grades 6 through 8 – Technology Standards and Expectations</b>			
<b>3. Research, Problem-Solving, and Communications</b> <i>(What students should know and be able to do by the end of 8th grade)</i>	<b>Grade</b> <i>(Continue to address earlier skill as needed. D=Developing M= Master E= Extend)</i>		
<i>3.1 Research</i>	<b>6</b>	<b>7</b>	<b>8</b>
3.1 Explain and demonstrate effective searching and browsing strategies when working on projects.	<b>D/ M</b>	<b>M</b>	<b>M</b>
3.2 Collect, organize, and analyze digital information from a variety of sources, with attribution.		<b>M</b>	<b>M</b>
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.			
<i>3.4 Problem Solving</i>	<b>6</b>	<b>7</b>	<b>8</b>
3.4 Independently use appropriate technology tools (e.g., graphic organizer) to define problems and propose hypotheses.	<b>D</b>	<b>D</b>	<b>D</b>
3.5 Use and modify databases and spreadsheets to analyze data and propose solutions.			<b>D</b>
3.6 Develop and use guidelines to evaluate the content, organization, design, use of		<b>M</b>	<b>M</b>

citations, and presentation of technologically enhanced projects.			
<b>3.7 Communication</b>	<b>6</b>	<b>7</b>	<b>8</b>
3.7 Plan, design, and develop a multimedia product to present research findings and creative ideas effectively, citing sources.		<b>D/ M</b>	<b>M</b>
3.8 Identify differences between various media and explain issues associated with repurposing information from one medium to another (e.g., from print to the Web).		<b>D/ M</b>	<b>D/ M</b>
3.9 Use a variety of telecommunication tools (e.g., e-mail, discussion groups, Web pages, blogs, Web conferences) to collaborate and communicate with peers, experts, and other audiences (at district's discretion).			<b>M</b>

<b>Massachusetts Technology Literacy Standards</b>				
<b>Grades 9 through 12 – Technology Standards and Expectations</b>				
<b>1. Basic Operations and Productivity Tools</b> <i>(What students should know and be able to do by the end of 12th grade)</i>	<b>Grade</b> <i>(Continue to address earlier skill as needed. D=Developing M= Master E= Extend)</i>			
<i>1.1 Basic Operations</i>	<b>9</b>	<b>10</b>	<b>11</b>	<b>12</b>
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.				<b>M</b>
1.2 Use online help and other support to learn about features of hardware and software, as well as to assess and resolve problems.				<b>D</b>
1.3 Install and uninstall software; compress and expand files (if the district allows it).				<b>x</b>
1.4 Explain effective backup and recovery strategies.				<b>D</b>
1.5 Explain criteria for evaluating hardware and software appropriate for a given task (e.g., features, versions, capacity).				<b>M</b>
1.6 Demonstrate keyboarding techniques, <sup>6</sup> including the use of keyboard shortcuts, to complete assignments efficiently and accurately. (For students with disabilities, demonstrate alternate input techniques as appropriate.)				<b>M</b>

1.7 Identify and assess the capabilities and limitations of emerging technologies.				<b>M</b>
<b>1.8 Word Processing/Desktop Publishing</b>	<b>9</b>	<b>10</b>	<b>11</b>	<b>12</b>
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.				<b>M</b>
1.9 Use editing features appropriately (e.g., track changes, insert comments).				<b>M</b>
1.10 Identify the use of word processing and desktop publishing skills in various careers.				<b>M</b>
<b>1.11 Database – The following skills are best taught in a comprehensive database course, which can be taken at any grade level in a high school.</b>	<b>9</b>	<b>10</b>	<b>11</b>	<b>12</b>
1.11 Explain the importance of designing the structure of a database to meet its intended goals.				<b>M</b>
1.12 Duplicate the structure of a database without data.				<b>D</b>
1.13 Save database files in various formats.				<b>D</b>
1.14 Manipulate non-alphanumeric digital data (e.g., geospatial data from MassGIS <sup>7</sup> , images, audio) within a database.				<b>x</b>
1.15 Define the term “metadata,” and explain how metadata describes the structure and workings of an organization's use of information.				<b>M</b>
1.16 Use database features to create mailing labels, form letters, and perform mail merges.				<b>M</b>

1.17 Identify the use of database skills in various careers.				<b>M</b>
<b>1.18 Spreadsheet</b>	<b>9</b>	<b>10</b>	<b>11</b>	<b>12</b>
1.18 Define and use functions of a spreadsheet application (e.g., sort, filter, find).				<b>M</b>
1.19 Enter formulas and functions; use the auto-fill feature in a spreadsheet application.				<b>M</b>
1.20 Explain and use advanced formatting features of a spreadsheet application (e.g., reposition columns and rows, add and name worksheets).				<b>M</b>
1.21 Differentiate between formulas with absolute and relative cell references.				<b>M</b>
1.22 Use multiple sheets within a workbook, and create links among worksheets to solve problems.				<b>M</b>
1.23 Import and export data between spreadsheets and other applications.				<b>M</b>
1.24 Create and use pivot tables.				<b>M</b>
1.25 Explain how various formatting options are used to convey information in charts or graphs.				<b>M</b>
1.26 Identify the use of spreadsheet skills in various careers.				<b>M</b>
<b>1.27 Internet, Networking, and Online Communication</b>	<b>9</b>	<b>10</b>	<b>11</b>	<b>12</b>

1.27 Use search engines and online directories. Explain the differences among various search engines and how they rank results.				<b>M</b>
1.28 Explain and demonstrate effective search strategies for locating and retrieving electronic information (e.g., using syntax and Boolean logic operators).				<b>M</b>
1.29 Describe good practices for password protection and authentication.				<b>M</b>
1.30 Demonstrate a basic understanding of addressing schemes (e.g., IP addresses, DHCP, DNS).				<b>M</b>
1.31 Identify career options in network technologies.				<b>M</b>
<b>1.32 Multimedia and Software Applications</b>	<b>9</b>	<b>10</b>	<b>11</b>	<b>12</b>
1.32 Identify technology tools (e.g., authoring tools) that can be used to create a multimedia product.				<b>M</b>
1.33 Use a variety of applications to plan, create, and edit multimedia products (e.g., slide presentations, videos, animations, simulations, podcasts).				<b>D</b>
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).				<b>M</b>
1.35 Identify career options in multimedia and software development.				<b>M</b>
<b>1.36 Web Authoring – The following skills are best taught in a comprehensive web design course, which can be taken at any grade level in a high school.</b>	<b>9</b>	<b>10</b>	<b>11</b>	<b>12</b>
1.36 Distinguish between effective and ineffective Web site designs; explain the reasons.				<b>X</b>
1.37 Explain terminology related to Web page authoring (e.g., HTML, URL, links, browsers, plug-ins, Web servers).				<b>X</b>

1.38 Use HTML or Web-authoring tools to create, edit, and publish well organized Web sites with effective navigation.				X
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).				X
1.40 Explain how to test and debug Web files for quality assurance.				X
1.41 Identify career options in Web design, development, and management.				X

<b>Massachusetts Technology Standards</b> <b>Grades 9 through 12 – Technology Standards and Expectations</b>				
<b>2. Ethics, Society, and Safety</b> <i>(What students should know and be able to do by the end of 12th grade)</i>	<b>Grade</b> <i>(Continue to address earlier skill as needed.  D=Developing  M= Master  E= Extend)</i>			
<b>2.1 Ethics</b>	<b>9</b>	<b>10</b>	<b>11</b>	<b>12</b>
2.1 Demonstrate compliance with the school's Acceptable Use Policy.				<b>M</b>
2.2 Explain issues related to the responsible use of technology (e.g., privacy, security).				<b>M</b>
2.3 Explain laws restricting the use of copyrighted materials.				<b>M</b>

2.4 Identify examples of plagiarism, and discuss the possible consequences of plagiarizing the work of others.				<b>M</b>
2.5 Write correct in-text citations and reference lists for text and images gathered from electronic sources.				<b>M</b>
2.6 Give examples of the appropriate and responsible use of communication tools (e.g., chats, instant messaging, blogs, wikis).				<b>M</b>
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.				<b>M</b>
<b>2.8 Society</b>	<b>9</b>	<b>10</b>	<b>11</b>	<b>12</b>
2.8 Design and implement a personal learning plan that includes the use of technology to support lifelong learning goals.				<b>M</b>
2.9 Evaluate the authenticity, accuracy, appropriateness, and bias of electronic resources, including Web sites.				<b>M</b>
2.10 Analyze the values and points of view that are presented in media messages.				<b>X</b>
2.11 Describe devices, applications, and operating system features that offer accessibility for people with disabilities.				<b>M</b>
<b>2.12 Safety</b>	<b>9</b>	<b>10</b>	<b>11</b>	<b>12</b>
2.12 Evaluate school and work environments in terms of ergonomic practices.				<b>M</b>
2.13 Describe and use safe and appropriate practices when participating in online				<b>M</b>



communities (e.g., discussion groups, blogs, social networking sites).				
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).				<b>M</b>
2.15 Explain ways individuals can protect their technology systems and information from unethical users.				<b>M</b>

<b>Massachusetts Technology Standards</b>				
<b>Grades 9 through 12 – Technology Standards and Expectations</b>				
<b>3. Research, Problem-Solving, and Communications</b> <i>(What students should know and be able to do by the end of grade)</i>	<b>Grade</b> <i>(Continue to address earlier skill as needed. D=Developing M= Master E= Extend)</i>			
<b>3.1 Research</b>	<b>9</b>	<b>10</b>	<b>11</b>	<b>12</b>
3.1 Devise and demonstrate strategies for efficiently collecting and organizing information from electronic sources.				<b>M</b>
3.2 Compare, evaluate, and select appropriate electronic resources to locate specific information.				<b>X</b>
3.3 Select the most appropriate search engines and directories for specific research tasks.				<b>X</b>
3.4 Search for information within an electronic source (e.g., using the find command).				<b>M</b>

<b>3.5 Problem Solving</b>	<b>9</b>	<b>10</b>	<b>11</b>	<b>12</b>
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).				<b>X</b>
<b>3.6 Communication</b>	<b>9</b>	<b>10</b>	<b>11</b>	<b>12</b>
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				<b>M</b>
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.				<b>X</b>
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).				<b>X</b>
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).				<b>X</b>
3.10 Complete at least one online credit or non-credit course or tutorial; discuss the benefits and disadvantages of this method of learning.				<b>X</b>