Technology Plan
2013-2015

Andover Public Schools

Prepared by:
The Office of Digital Learning In
Conjunction with the
Technology Task Force

Updated April 2013

Andover Public Schools
Technology Task Force

Joanne Najarian	Director of Digital Learning
Nancy Duclos	Assistant Superintendent
Paul Puzzanghera	Chief Information Officer
Pamela Lanthop	Principal, High Plain Elementary
Doug Nebel	Assistant Principal, Doherty Middle
Barbara Murray	Digital Learning Specialist, Doherty Middle
Shelley Coughlin	Digital Learning Specialist, West Middle
Julie Spang	Digital Learning Specialist, Andover High School
Marjorie Andresen	Grade 8 Math Teacher, West Middle School
Francis McCall	Grade 5 Teacher, West Elementary
Jorge Allen	World Language Program Advisor
Alan Michel	Community Member
Mark Stefferson	Parent, Community Member

Andover Public Schools

District Technology Plan 2013-2015

Table of Contents

Technology Vision Statement

Andover Public Schools is committed to providing a technology rich learning environment that promotes the development of 21st century skills and understandings necessary for both students and staff to compete in the global workforce.

We will strive to meet the needs of our 21st century learners with a technologically infused and progressive curriculum, which incorporates the 4Cs (Collaboration, Communication, Critical Thinking and Creativity). We will also endeavor to use technology to help us collect and analyze student, educator, and district achievement.

The Technology Plan outlines the multi-year strategic goals for the deployment and use of technology in Andover Public Schools The primary purpose of the Technology Plan is to provide direction for the future use of technology. It focuses on the use of technology to support the curriculum and delineates the objectives and strategies for classroom technology, individual student technology, technology required to support school and division operations, and the technology infrastructure. The APS Technology Plan is grounded in instruction but includes elements to advance operational efficiency.

We envision using technology to further a learning community where Students:

- Demonstrate creative thinking, construct knowledge, and develop innovative products and processes using technology;

- Use digital media and environments to communicate and work collaboratively, including at a distance, to support individual learning and contribute to the learning of others

- Apply digital tools to gather, evaluate, and use information;

- Use critical thinking skills to plan and conduct research, manage projects, solve problems, and make informed decisions using appropriate digital tools and resources;

- Understand human, cultural, and societal issues related to technology and practice legal and ethical behavior;

- Demonstrate a sound understanding of technology concepts, systems and operations.

We envision using technology to further a learning environment where Teachers:

- Use their knowledge of subject matter, teaching and learning, and technology to facilitate experiences that advance student learning, creativity, and innovation in both face-to-face and virtual environments;

- Design, develop, and evaluate authentic learning experiences and assessments incorporating contemporary tools and resources to maximize content learning in context and to develop the knowledge, skills, and attitudes outlined in the vision for our students;

- Exhibit knowledge, skills, and work processes representative of an innovative professional in a global and digital society;

- Understand local and global societal issues and responsibilities in an evolving digital culture and exhibit legal and ethical behavior in their professional practices;

- Continuously improve their professional practice, model lifelong learning, and exhibit leadership in their school and professional community by promoting and demonstrating the effective use of digital tools and resources.

We envision using technology to further a learning environment where Educational Administrators will:

- Inspire and lead development and implementation of a shared vision for comprehensive integration of technology to promote excellence and support transformation throughout the organization;

- Create, promote and sustain a dynamic, digital-age learning culture that provides rigorous, relevant, and engaging education for all students;

- Promote an environment of professional learning and innovation that empowers educators to enhance student learning through the infusion of contemporary technologies and digital resources;

- Provide digital-age leadership and management to continuously improve the organization through the effective use of information and technology resources;

- Model and facilitate understanding of social, ethical, and legal issues and responsibilities related to an evolving digital culture.

In support of our vision and the district mission, Andover Public Schools endeavors to meet the challenges of the State and National Education Technology Plan in the following areas:

- **Learning:** Change the learning process so it's more engaging and tailored to students' needs and interests.

- **Assessment:** Measure student progress on the full range of college and career ready standards and use real time data for continuous improvement.

- **Teaching:** Connect teachers to the tools, resources, experts and peers they need to be highly effective and supported. Support the integration and facilitate the use of technology throughout our professional learning community.

- **Infrastructure:** Provide broadband connectivity for all students, everywhere—in schools, throughout communities and in students' homes.

- **Productivity:** Use technology to help schools become more productive and accelerate student achievement while managing costs.

I: District & Community Profile

When the Town of Andover was incorporated on May 6, 1646, there were about 1500 residents. The Andover of today has a population of approximately 31,700. The history of Andover is rich in culture and tradition and has long been noted for the high quality of education offered to all students.

Andover is located 25 miles north of Boston and is easily accessible to Interstate Highways 495,93, and 95, and to Routes 28 & 133. While Andover remains essentially a residential community, it has several large industrial parks and also a number of biotechnology and pharmaceutical companies. Andover is characterized as a typical New England town with wide, tree-lined streets and white steeped churches. It is also the home of Phillips Andover Academy, an internationally famous private secondary school.

The Public Schools of Andover, in fiscal year 2007, served 6001 students in pre-kindergarten through grade twelve with a professional and support staff of 849. Approximately 14.9% of the students are served through the special education department with needs ranging from mild learning disabilities to severe, multiple handicaps. In-house programs, services and contract agreements with other communities help provide appropriate learning environments for these students. Andover's free/reduced cost lunch programs serve approximately 201 students each day. Through the continued efforts of a highly professional faculty and a FY 07 appropriation of $55,671,088 (funded through property tax assessments of $11.40/$1000 (residential) and $17.95/$1000 (commercial), the public schools maintain a high quality educational program for the students of Andover.

Bancroft, High Plain, Sanborn, South, and West Elementary constitute Andover's five K-5 elementary schools. Shawsheen, a K-2 primary school, is an open-enrollment school. All K-5 elementary schools are organized by teaching teams that work closely with Learning Specialists, Art, Music, Instructional Technology Specialists, Library/Media Specialists, Physical Education Specialists, Reading Specialists and Special Needs Teachers to plan and carry out instruction. Teaching strategies and curricula are based upon sound growth and development principles. Hands-on, process-oriented instruction using concrete materials is a major instructional strategy.

Andover also has three middle schools, which serve 1,474 students. Teaching teams, grades 6-8, organize Doherty Middle School, West Middle School, and Wood Hill Middle School. These teams are responsible for providing a core academic program that promotes multiple literacies, critical thinking, and healthful lifestyles. Interdisciplinary units of instruction that integrate content and expressive arts are encouraged, as are hands-on exploration activities. The grade-level teams work closely with the Integrated Arts, Physical Education, and World Language teams to enrich these interdisciplinary units. The application of technology is promoted in all middle school programs.

Andover High School is an academically oriented high school serving 1,775 students. A total of 72 courses are offered in ten content/subject areas in grades 9 through 12. In addition to the core curriculum, team-taught and integrated courses are available in English/Social Studies, English/Art, and Social Studies/Fine Arts. Advanced placement courses are offered in English, Spanish, Modern European History, US History, Calculus, Physics, Chemistry, and Biology. Plans are underway to expand the offerings of AP courses in Computer Technology and Ecological Sciences.

Andover Public Schools have been involved in collaboration with scientific companies located in Andover: Digital, Eisai Research Institute, Hewlett-Packard, Genetics Institute, Picture Tel, Raytheon, Smith and Nephew, and Vicor. These companies have generously sponsored and funded student enrichment, staff development activities and technology equipment in the field of science and technology. The Stevens Foundation, a non-profit organization, has provided funding for Andover teachers to attend staff development programs sponsored by the Museum of Science. The Andover Fund for Education (AFE) is a partnership between the Andover community and the public schools as is the Andover Education Improvement Association (AEIA). The aim of these non-profit organizations is to solicit business, private, and community resources to provide support for school programs and activities.

In 1994, the Town of Andover overrode Proposition 2 1/2 to bond $38,000,000 for a comprehensive facility expansion and renovation project for three of its eight school buildings. This bonding included an appropriation of $1,600,000 for technology. The Town also appropriated an additional $2,000,000 for the integration of technology into each of the five remaining, non-building project schools.

At the Year 2000 Town Meeting, the citizens of Andover voted to build a new middle school and a new elementary school. This included $1.1 million for technology.

II. District Benchmarks 2013-2015

Benchmark 1

Commitment to a Clear Vision and Implementation Strategies

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

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

C. Needs Assessment

1. The district assesses the technology products and services that will be needed to improve teaching and learning.

2. The technology plan includes an assessment of the services and products that are currently being used and that the district plans to acquire.

D. Budget

1. The district recognizes that technology plays a critical role in achieving its goals. The district has a budget that will ensure the implementation of its long-range technology plan.

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

3. The district seeks funding for technology programs from federal, state, and private resources, as well as from academic departments that are supported by technology. The district explores ways that technology can reduce costs and create efficiencies in other areas of the district budget.

4. For districts that plan to apply for E-rate reimbursement, the technology plan specifies how the district will pay for the non-discounted portion of their costs for the services procured through E-rate.

E. Evaluation

1. The district routinely consults with technology staff before purchasing technologies items, to ensure that the items are appropriate, cost-effective, and sustainable. The district will work to create technology integration procedure for all staff.

2. The district's technology plan includes an evaluation process that enables it to monitor its progress in achieving its goals and to make mid-course corrections in response to new developments and opportunities as they arise. The STaR Chart will be regularly used to assess our progress and to support district-wide and school-wide goals.

Benchmark 2

Technology Integration and Literacy

A. Technology Integration

Teachers integrate evolving technologies that enhance student interest, inquiry, analysis, collaboration, and creativity. As teachers move toward Advanced Tech on the STaR chart the instruction will gravitate toward student-centered learning where the students are using the technologies themselves.

B. Technology Literacy

- The APS Digital Learning Strategic Plan outlines the goals and progress benchmarks that will address student and teachers technology literacy.

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

C. Staffing

1	Director of Digital Learning
4	Digital Learning Specialists (1 – AHS, 1 - DMS, 1 -WMS, 1- WHMS)

Benchmark 3

Technology Professional Development

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

2. Professional development planning includes an assessment of district and teachers' needs.

Full Professional Development plan is outlines in APS Digital Learning Strategic Plan

---

[3] The *Technology Self-Assessment Tool* is available on the Department's website (http://www.doe.mass.edu/edtech/standards/sa_tool.html) .

[4] The *Technology Self-Assessment Tool* is available on the Department's website (http://www.doe.mass.edu/edtech/standards/sa_tool.html).

[5] A sample administrator technology self assessment tool is available on the Department's web site (http://www.doe.mass.edu/edtech/standards/tsat_sampadmin.html). Administrators may also want to refer to the *National Educational Technology Standards (NETS•A) and Performance Indicators for Administrators* published by the International Society for Technology in Education (http://www.iste.org/Content/NavigationMenu/NETS/ForAdministrators/2009Standards/NETS-A_2009.pdf).

Benchmark 4

Accessibility of Technology

A. Hardware Access

All students and teachers in the district have access to internet connected PC's:

- Elementary classrooms typically have 2-4 PC's per classroom with one designated as a teacher machine
- Media centers in each building are equipped with 25-30 internet connected workstations
- High school and middle schools have additional computer labs dedicated to science, math, social studies, music or graphics design
- Mobile computing carts of 25-30 laptop computers are available in each building
- Over the past 18 months the district has acquired in excess of 500 Apple iPad tablets which are being integrated at all levels of the curriculum
- Over 1700 workstations are currently available for student use throughout the district. The district has not purchased very few Windows based student workstations during the past 4 years but have received several hundred fully functioning used machines as donations from federal agencies
- The longer run strategy is to deemphasize the use of lab based computing and move to a student based 1:1 initiative. Due to funding constraints the district will be unlikely to provide the majority of these machines directly but instead will work with our families to create a Bring Your Own Device (BYOD) type initiative. These will be supplemented by district provided devices for families who would be otherwise unable to participate in this initiative. This program is still in its early developmental stages
- A new graphics lab at the high school and a new music lab at the West Middle School have been installed with state of the art Apple workstations
- Many teachers currently have Windows based laptop computers that they are able to use both in school and at home. This fleet is all 5+ years old and is being refreshed by 400 new MacBook Pro computers. Half of the teacher population will be upgraded during 2012-2013 and the remainder will be upgraded in 2013-2014
- By the conclusion of 2012-2013 every elementary classroom will be equipped with an interactive SmartBoard device and all middle schools plus the high school will be equipped with a new interactive short throw projector (Epson 485wi)
- The district has over 1000 laser and inkjet printers available for classroom and administrative use
- A number of classrooms are equipped with interactive "clicker" systems to create and expedite assessments

B. Internet Access

Internet access is provided via two 150mbps broadband connections connected to our Astaro firewall. We currently utilize 40-60% of our bandwidth on any given day. All content is filtered to be CIPA compliant. All schools share access to this resource. All schools have 4-6 wired Ethernet connections in each classroom and shared common spaces such as media centers.

C. Networking (LAN/WAN)

All school buildings are connected by 6 pairs of single mode fiber, which are "home run" to our main data center located in the school administration building. Within each building, each classroom and shared space has 4-6 wired Ethernet ports connected via CAT5 (CAT5e/CAT6 in newer buildings) to our switches in the school's network closets. All WAN/LAN traffic is carried over this infrastructure.

Currently, buildings are connected to the main data center at 1Gb and virtually all switches support 1Gb directly to the desktop. We anticipate increasing the bandwidth to 10Gb from our data center to larger school buildings and 20Gb to the high school during 2013.

Wireless networking is currently available to a limited degree in most of our buildings. Most of these access points are older A/B/G level devices and they do not provide uniform coverage through all school buildings. During 2013 the wireless capability will be upgraded to provide uniform coverage to all schools using newer 801.11n capable access points. Access points will initially be deployed in a ratio of 1 access point for every 2 classrooms. Access point density will be increased as needs require. Mobile device management (MDM) software will also be deployed to help manage and secure wireless devices.

In future years it is anticipated that students will bring personal devices to the classroom as part of their learning environment. Network upgrades are expected to provide full internal and external connectivity to all of those devices.

---

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

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

D. Access to the Internet Outside the School Day

Andover does not provide access to internal or external network resources outside of our physical buildings. Depending on individual school policies network resources are available within the school buildings for 1-2 hours after the normal close of school.

E. Staffing

The Andover IT department is composed of:

1	Chief Information Officer
4	Network Administrators
5	Support technicians
1	Asset manager
3	Application specialists
1	GIS specialist
1	Office manager

In 2013-14 the district will launch a for credit program at the high school to train students to act as first level technical specialists to triage and address basic technology concerns of the high school staff.

Benchmark 5

Virtual Learning and Communications

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

B. Classroom applications of virtual learning include courses through EdX and Merrimack College, collaborative projects, field trips, and discussions.

C. The district maintains an up-to-date website that includes information for parents and community members.

D. Aspen X2 Family Portal will be utilized for the 2013 – 2014 school.

Benchmark 6

Safety, Security, and Data Retention

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

B. The district educates teachers and students about appropriate online behavior. Topics include cyber-bullying, potential risks related to social networking sites and chat rooms, and strategies for dealing with these issues.[8]

C. The district has a plan to protect the security and confidentiality of personal information of its students and staff.[9]

D. The district complies with federal and state law[10], and local policies for archiving electronic communications produced by its staff and students. The district informs staff and students that any information distributed over the district or school network may be a public record.

---

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

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

[10] Information about state regulations is available from the state's Record Management Unit (http://www.sec.state.ma.us/arc/arcrmu/rmuidx.htm).

IV. Three Year Plan Goals

In accordance with the district mission and the guidelines provided by the Massachusetts School Technology Chart (see appendix) and District Technology Benchmarks 2013-2015 (see above), the Technology Task Force are developing a three-year plan (during 2012 – 2013 school year) designed to increase the level of proficiency with which Andover Public Schools addresses these standards.

As with any long-range plan the goal is to provide a road map for continual improvement.

The Process

The Technology Task Force was established utilizing the skills and experiences of individuals from with the school district; (teachers, administrators, program advisors, digital learning specialist) community representatives and parents.

The process for developing and evaluating the strategic plan was achieved through a series of meetings where participants evaluated the technology survey, goals, strategies, and measures in small group interaction.

College Ready – Students as Leaders

The job market of the 21st century will require employees to successfully complete some post-secondary education.

Career Ready – Students as Employees

Many of the jobs for our graduates have yet to be created. To prepare for a future that is unpredictable requires a focus on skills and experiences to be successful employee no matter what career pathway they choose. All Andover students will graduate with an electronic portfolio.

* This is a work in progress, development to be completed in the Fall of 2013.

Andover Public Schools

Digital Learning Strategic Plan

Digital Learning Vision
APS students will be immersed in learning environments in which technology is a seamless and fully integrated component of everyday classroom lessons and projects to prepare them for living in and working in a society dominated by digital communication.

Andover Public Schools
Strategic Plan Focus Area 2: Technology Supported Learning

Digital Learning: APS students will be immersed in interactive technology rich classrooms that support instruction and student learning to prepare them for a society dominated by digital communication.

Outcomes
- Promote the development of 21st century skills that will ensure students graduate Future Ready.
- Incorporate the 4 C's (Collaboration, Communication, Critical Thinking and Creativity)
- Utilize technology as a means for collecting, categorizing, and analyzing student achievement data to develop the strongest instructional plan available.

Strategy 2: Create technology-rich digital classrooms where students and teachers use appropriate and safe technology tools and resources that support the learning and teaching process.

Objective	Action Steps	Progress Benchmarks	Time Frame	Action Team
2.0 Teachers will successfully participate in a robust PD Environment that includes online and blended courses.	o Determining student learning action plan (teaching and learning) Considering: • Impact of Technology on Teacher Role • Patterns of Teacher Use (teacher's proficiency with technology)	• Complete curriculum and documented benchmarks and assessments that are aligned to Massachusetts State Framework and ISTE NETs for teachers and students. • Access to robust technology that supports teaching and learning	2013 - 2015	Director of Digital Learning, Digital Learning Department, Tech Task Committee, Advisory Committee, Assistant Superintendent

	• Design of Instructional Setting • Curriculum Areas • Patterns of Student Use • Determine mechanism for course approval and credit	• Implement mechanism for course approval and credit		
2.1 Students will successfully participate in online and blended courses by the time of graduation.	o Strategy 2.1.1 Provide student access to online courses for credit. o Strategy 2.1.2 Provide the infrastructure, software portal resources, and educator training necessary to support online learning for students	• Provide opportunities for students to participant in virtual school through EDx • Additional STEAM course offerings at the high school • Access to robust technology that supports their learning		
2.2 Educators and students will become proficient in safe and productive Internet use.	o Strategy 2.2.1 Provide Internet safety learning opportunities and curricular resources, including the safe and responsible use of social media, staying within the CIPA/COPPA Compliance.	• Develop and deliver curriculum that support and align with ISTE NETs for teachers and students. • Access to robust technology that supports teaching and learning		

Strategy 3: Engage students in meaningful curricular content through the purposeful and effective use of technology. Ensure that technology is integrated within the curriculum through Collaboration, Critical Thinking, Communication and Creativity (4Cs).

Objective	Action Steps	Progress Benchmarks	Time Frame	Action Team
3.1 Educators will develop skills in interactive, engaging, adaptive instruction, which incorporates Collaboration, Critical Thinking, Communication and Creativity (4Cs). The curriculum will reflect effective integration of technology.	• Strategy 3.1.1 Provide training and coaching support to curriculum writing and revision teams to improve technology integration. • Strategy 3.1.2 Provide job-embedded professional development to create and implement content-specific technology-infused learning activities. • Strategy 3.1.3 Provide a variety of online learning resources for educators to improve their instruction.	• Create a baseline on current integration and determine next steps towards • • Begin to integrate effective reflective technology into current classroom instruction.	2013 -2014	
		•	2014 -2015	

Andover Public School Technology Plan 2013 - 2015

18

	• Strategy 3.1.4 Determine and implement vehicle for digital content management, storage and delivery.			
Strategy 4: Afford students with opportunities to apply technology effectively to gain knowledge, develop skills, and create and distribute artifacts that reflect their understanding.				
4.1 Educators will have access to pedagogical and coaching support for integrating technology into teaching and learning.	• Strategy 4.1.1 Provide Digital Learning Specialist at all levels.	• Equity across the district in all schools at all levels. • Additional faculty hired to implement plan.	2014 – 2015	School committee, Director of Digital Learning, School Administration, Assistant Superintendent
4.2 Students will communicate and collaborate with their peers within Andover and around the world.	• Strategy 4.2.1 Provide learning experiences that promote cross-class, cross district collaboration and communication through online digital Web 2.0 Tools	•	2013 - 2015	
4.3 Students and teachers will become proficient in digital and information literacies.	• Strategy 4.3.1 Provide opportunities for educators and students to analyze and evaluate online content.	•		
4.4 Students will represent their academic work, and experiences electronically.	• Strategy 4.4.1 Provide the infrastructure, hardware, software, and training for students to support the creation of electronic portfolios.	• Redefine artifacts by which we measure student performance (not only knowledge acquisition) demonstrating progress in the 4C's.		
4.5 Students will be provided with a variety of assistive technologies to ensure diverse learning needs are met.	• Strategy 4.5.1 Examine software and hardware up for adoption to gauge and catalog its assistive technology (AT) features based on best practice AT guidelines.	• LearningAlly will be available for all students • Use of	2013 - 2014	

The implementation tasks in this report help address three target areas of improving Proficiency (P), Equity (E), and Infrastructure (I). They include:

Equity (E)
Striving to ensure a common experience throughout the district. This includes access to both technical and educational support, as well as access to comparable infrastructure and hardware. Additionally, equity includes a common set of expectations for staff and students.

Proficiency (P)
Supporting the need for staff development in technology use to support teaching and learning; developing and disseminating student learning expectations.

Infrastructure (I)
Supporting acquisition, performance, and replacement cycle of hardware and network equipment

REORGANIZATION OF THE TECHNOLOGY DEPARTMENT (P, E)

A. The school's Instructional Technology Department has been renamed Digital Learning Office to distinguish it from Information Technology (IT). The department now includes the libraries and is called the Office of Digital Learning.

- Collaboration between Digital Learning and Library staff.
- Added additional staffing of 1.0 Educational Technology Specialist at AHS.
- Added additional staffing of 3 1.0 Digital Learning Specialist at the Middle School Level.
- Revised job description of the Librarians

B. Help Desk Consolidation
Help Desk services moved from an assigned site support model to a central distributed model. This model is more flexible and potentially more effective in that support can be assigned based on end-user need and expertise of the technician.

UPDATE STUDENT TECHNOLOGY STANDARDS AND ENSURE ALIGNMENT WITH ISTE (P, E)

A draft version of the updated Learning Expectations for students in Kindergarten through Grade 12 has been completed. These Learning Expectations are based on state and national (I.S.T.E.) standards for students. Stakeholder feedback is being gathered in preparation for presentation to the Curriculum sub-committee of the Andover School Committee.

DEVELOP A COMPREHENSIVE TECHNOLOGY PROFESSIONAL DEVELOPMENT PLAN (P, E)

The Director of Digital Learning will work with the Professional Development, Committee the Educational Technology Specialists and the Technology Advisory Committee to create a comprehensive plan to address the educational technology professional development needs for the district. This plan will address PD needs that support teachers' technology use for both administrative functions and teaching and learning, as well as, administrators' productivity use and role in technology leadership.

CONTINUE TO ASSESS AND IMPROVE INFRASTRUCTURE (I, E)

EVALUATING PROGRESS (P, E, I)

The success of the Digital Learning program requires the development of an evaluation process to measure the program's effectiveness over time. Existing metrics for data gathering need to be developed further, and realistic timelines for evidence of improvement need to be established. Specific metrics will be identified that are aligned with the goals and objectives of the tasks identified in the plan. Some of the initiatives in the plan will be piloted before being fully adopted; a data strategy for these pilots will be developed. This evaluation strategy will move beyond anecdotal evidence and improve the district's use of consistent data to inform decisions and evaluate progress.

APPENDIX-A

POLICIES

APPENDIX – B

STaR Chart

Massachusetts School Technology and Readiness Chart
(STaR Chart)

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

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

1. Teaching and Learning

   - Impact of Technology on Teacher Role
   - Patterns of Teacher Use*
   - Design of Instructional Setting
   - Curriculum Areas
   - Patterns of Student Use*

2. Educator Preparations and Development

   - Content of Training

- Capabilities of Educators*

- Leadership of Principals, Teacher Leaders, and District Administrators

- Models of Professional Development

- Levels of Understanding

- Universal Access: Integration of Universal Design and Assistive Technology

3. Administration and Support Services

- Vision and Planning

- Technical Support (hardware, operating system, network)*

- Technology Integration Specialist*

- Budget Levels

- Budget Allocated for Technology (Total Cost of Ownership)*

4. Infrastructure for Technology

- Universal Design and Accessible Technology Considerations (e.g. Section 508)

- Students Per Instructional Computer*

- Internet Access Connectivity/Speed*

- E-learning Environments*

- LAN/WAN *

- Other Technologies

- Safety and Security*

The STaR Chart was derived from the Texas chart[ii] of the same name several years ago. The Massachusetts STaR Chart has subsequently been updated several times. This is the first update since November 2006.[iii] Note that the axes of the 2006 STaR chart have been transposed for the 2010 version.

WHY A STAR CHART

There are several reasons why ETAC maintains this chart:

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

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

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

- Safety and Security (Row W)

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

STaR Chart Assumptions

There are several assumptions built into this work:

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

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

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

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

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

TEACHING AND LEARNING

Row	Focus Areas	Levels of Progress			
		Early Tech	**Developing Tech**	**Proficient Tech**	**Advanced Tech**
(A)	**Impact of Technology on Teacher Role**	Mostly teacher-centered lectures. Minimal student use of technology in instruction.	Mostly teacher directed learning. Students use technology to work on individual projects.	Mostly teacher-facilitated learning. Students use technology for cooperative projects in their own classroom.	Mostly student-centered learning, teacher as mentor/facilitator. Students use technology to communicate and collaborate outside the classroom.
(B)	**Patterns of Teacher Use**	85% of teachers use technology as a productivity tool (e.g., email, grades) and/or as a classroom supplement (e.g. drill and practice).	85% of teachers explore using technology to support curriculum goals (e.g. research, lesson planning).	85% of teachers use technology for research, lesson planning, multimedia and graphical presentations, and simulations. Teachers share technology uses with colleagues.	85% of teachers integrate evolving technologies that transform the teaching process by allowing for greater levels of access, interest, inquiry, analysis, collaboration, creativity, and content production.
(C)	**Design of Instructional Setting**	Mostly computer labs or libraries; scheduled use only.	Labs, libraries, many classrooms; flexible scheduling.	Lab, libraries, all classrooms, and portable technology (e.g. wireless laptops or handheld electronic devices); flexible scheduling.	Seamlessly integrated throughout classes and all content areas. Technology is available anytime both in school and within the community.

Row	Focus Areas	Levels of Progress			
		Early Tech	**Developing Tech**	**Proficient Tech**	**Advanced Tech**
(D)	**Curriculum Areas**	Limited to teaching technology skills at different grade levels.	Use of technology is minimal in a few curricular areas across grade levels.	Integrated into most Curriculum Framework areas and activities at all grade levels.	Integral to all curricular areas at all grade levels.
(E)	**Patterns of Student Use**	Less than half of students show proficiency in all Massachusetts Technology Literacy Standards and Expectations[iv] for their grade.	More than half of students show proficiency in all Massachusetts Technology Literacy Standards and Expectations for their grade.	Almost all of students show proficiency in all Massachusetts Technology Literacy Standards and Expectations for their grade.	All students show proficiency in all Massachusetts Technology Literacy Standards and Expectations for their grade.
(F)	**Content of Training**	Technology skills (email, word processing, Iinternet browser use, etc.) for teachers' professional use.	Training encompasses more complex professional uses (district applications such as attendance and report cards, scanners, cameras) and curriculum integration strategies.	Training directly ties technology to its use in content areas and how to effectively manage it in the classroom.	Training focuses on modeling, mentoring, and adopting new technologies as well as the integration of Universal Design and access considerations for all students.

EDUCATOR PREPARATION AND DEVELOPMENT

Row	Focus Areas	Levels of Progress			
		Early Tech	**Developing Tech**	**Proficient Tech**	**Advanced Tech**
(G)	**Capabilities of Educators**	100% meet TSAT and/or local district teacher technology competencies and implement them into the school environment.	80% meet TSAT and/or local district teacher technology competencies and implement them into the school environment.	80% meet TSAT and/or local district teacher technology competencies and implement them into the school environment.	80% meet TSAT and/or local district teacher technology competencies and implement them into the school environment.
(H)	**Leadership of Principals, Teacher Leaders and District Administrators**	Recognizes benefits of technology in instruction to improve learning outcomes for all students. Minimal personal use (email, word processing, Internet browser use, etc.). Awareness of national standards for administrators.	Supports use of technology in instruction. Uses technology in daily work. Approaching proficiency of national standards for administrators.	Recognizes and identifies exemplary use of technology in instruction. Uses technology skills in daily work such as research and communication and models appropriately with staff. Provides constructive feedback to teachers on their technology use.	Promotes exemplary use of technology in instruction. Models and uses in daily work in communication, presentations, online collaborative projects, and management tasks. Develops a school culture that expects all teachers to use technology. Advocates in the community for the integration of technology in instruction. Expects all teachers to use technology well.

Row	Focus Areas	Levels of Progress			
		Early Tech	**Developing Tech**	**Proficient Tech**	**Advanced Tech**
(I)	**Models of Professional Development**	Whole group, skill-based training with minimal follow-up.	Whole group curriculum-based training with follow-up to facilitate classroom implementation.	Coaching, modeling best practices, district-based mentoring. Involvement in a development / improvement process. Study groups.	Creates a culture of inquiry, sharing and knowledge building. Anytime learning available through a variety of delivery systems (e.g., just-in-time support, mentoring, peer observation).
(J)	**Levels of Understanding**	Most at entry or adoption stage (Students learning to use technology; teachers use technology to support traditional instruction).	Most at adaptation stage (technology used to enrich curriculum). Most beginning to use with students.	Most at appropriation stage (technology is integrated, used for its unique capabilities).	Most at invention stage (teachers discover and accept new uses for technology).

Row	Focus Areas	Levels of Progress			
		Early Tech	**Developing Tech**	**Proficient Tech**	**Advanced Tech**
(K)	**Universal Access: Integration of Universal Design and Assistive Technology**	Emerging awareness of universal design and assistive technologies (hardware/software) limited to special educators; few examples across the district of universal design strategies or assistive technology used to promote access to the general curriculum.	Awareness of universal design and assistive technologies (hardware/software) by special educators & some general educators; universal design strategies or assistive technology used to promote access to the general curriculum demonstrated across all grade levels.	Awareness of universal design and assistive technologies (hardware/software) by special educators & most general educators; universal design strategies or assistive technology used to promote access to the general curriculum demonstrated across all grade levels; staff are designated to provide AT assessment, procurement, support (training) and maintenance.	Systemic adoption of universal design strategies throughout the curriculum and the seamless integration of assistive technology to promote access to the general curriculum for all students; staff are designated to provide AT assessment, procurement, support (training), and maintenance.

		Levels of Progress			
Row	Focus Areas	Early Tech	Developing Tech	Proficient Tech	Advanced Tech
(L)	Vision and Planning	Minimal technology plan; technology used mainly for administrative tasks such as word processing, budgeting, attendance, grade book.	The technology plan is aligned with the Massachusetts Technology Plan, and is approved by the School Committee & supported by the Superintendent. Plan collaboratively developed by key stakeholders (e.g., teachers, parents, community members, local business, and individuals with disabilities), guiding policy and practice. Addresses local district teaching and learning standards.	In addition, the Technology Plan is integrated into district plan; used for internal planning, budgeting, applying for external funding and discounts. Teachers and administrators have a vision for technology use in support of student learning, teacher professionalism, and data management.	The technology plan and vision are focused on improving the success of all students based on needs, research, proven teaching and learning principles and is actively supported by the School Committee and Superintendent. Technology plan is collaboratively developed, guiding policy and practice; updated at least annually.

Row	Focus Areas	Levels of Progress			
		Early Tech	**Developing Tech**	**Proficient Tech**	**Advanced Tech**
(M)	**Technical Support (hardware, operating system, network)**	Some technical support and minimal support tools to resolve 95% of problems in greater than five days. Problems cause major disruptions to curriculum delivery using technology.	Sufficient technical staff and support tools to resolve 95% of problems in two to five days. Same-day technical support for infrastructure problems by call-in. Problems sometimes cause major disruptions to curriculum delivery using technology. Designated Network Administrator.	Sufficient technical staff and support tools to resolve 95% of problems within two days. Same-day in-classroom technical support available. Problems infrequently cause major disruptions to curriculum delivery using technology. Network administrator.	Sufficient technical staff and support tools to resolve 95% of problems within one day. Technical support is readily available on-site for both infrastructure and application problems. Problems do not cause major disruptions to curriculum delivery using technology. Network administrator.
(N)	**Technology Integration Specialist**	No district level Technology Director. Local instructional technology support is inconsistent.	District level Technology Director. One-half instructional technology specialist per 60-120 staff.	District level Technology Director. Dedicated instructional technology specialist—one half person per 30-60 staff. Dedicated staff at district level for data management and assessment.	District Technology Director. Dedicated instructional technology specialist—one half person per 30-60 staff. Dedicated staff at district level for data management and assessment and to help produce integrated curriculum content.

Row	Focus Areas	Levels of Progress			
		Early Tech	**Developing Tech**	**Proficient Tech**	**Advanced Tech**
(O)	**Budget Levels**	Budget for hardware and software purchases and professional development.	Budget for hardware and software purchases (new and replacement) and professional development, minimal staffing support, and some ongoing costs.	Budget for purchases, professional development, adequate staffing support, and ongoing costs. Other state, federal, and local programs directed to support technology funding. Business partnerships, donations, and other local funding designated for technology.	Budget for purchases, incentives for professional development, sufficient staffing support, and ongoing costs. Appropriate budget to support district technology plan.
(P)	**Budget Allocated for Technology (Total Cost of Ownership)**	Less than $175 per student.	Between $175- $300 per student.	Between $300 - $425 per student	$425 or more per student

Row	Focus Areas	Levels of Progress			
		Early Tech	Developing Tech	Proficient Tech	Advanced Tech
(Q)	Universal Design and Accessible Technology Considerations (e.g., Section 508)	Considerations for universal design and accessible technologies are limited to the Individual Education Program (IEP) process for students with disabilities. Procurement policies for information and instructional technologies do not ensure usability, equivalent access, or interoperability.	Considerations for universal design and accessible technologies are established in areas of high student use (e.g., libraries, computer labs); inconsistent implementation of procurement policies for information and instructional technologies that ensure usability, equivalent access, and interoperability.	Considerations for universal design and accessible technologies are established in areas of high student use (e.g., libraries, computer labs), some classrooms and administrative offices; routine implementation of procurement policies for information and instructional technologies that ensure usability, equivalent access, and interoperability.	Universal design and accessible technologies considerations are established throughout the district; procurement policies for information and instructional technologies that ensure usability, equivalent access, and interoperability in accordance to the guidelines established by Section 508.

Row	Focus Areas	Levels of Progress			
		Early Tech	**Developing Tech**	**Proficient Tech**	**Advanced Tech**
(R)	**Students Per Instructional Computer**	10 or more students per Type A or B computer; no firm computer replacement policy established by district.	Fewer than 10 students per Type A and B computer; replacement policy established; one computer per teacher.	Fewer than 5 students per Type A and B computer; replacement cycle established for 6 years or less; one computer per teacher—possibly a laptop for working at home. Most students have access to handheld electronics. Maintains a list of places students can use technology outside of school.	One student per Type A and B computer or other electronic device. Replacement cycle established for 5-6 years or less; one computer per teacher—possibly a laptop for working at home. 75% of computers meet Massachusetts A/B standards. School works with community to provide equitable access to technology for students and community members after school hours.

INFRASTRUCTURE FOR TECHNOLOGY

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

Ro w	Focus Areas	Levels of Progress			
		Early Tech	Developing Tech	Proficient Tech	Advanced Tech
(T)	E-Learning Environments	Web- and/or satellite-based interactive learning opportunities delivered synchronously or asynchronously, on a scheduled or unscheduled basis, primarily for professional development on a limited basis.	Expanded web- and/or satellite-based interactive learning opportunities with the possible addition of asynchronous video streaming or synchronous videoconferencing. The addition of courses for professional development for teachers and student courses at the high school and college level (K-16).	Building upon Developing Tech, development of connections for improved access to web-based and/or interactive IP-based video learning on the local, state, regional, national, and international level (school to school, district to district, school/district to state, state to state, country to country). Applications to include courses, cultural projects, virtual field trips, etc.	Seamless IP-based infrastructure expanded to K-16 to allow development of high-quality web- and video-based content. Content distribution available for all students and teachers. Archives allow for content review asynchronously and sharing/distribution of these resources.

Row (U)	Focus Areas	Levels of Progress			
		Early Tech	Developing Tech	Proficient Tech	Advanced Tech
	LAN	Limited print/file sharing network at each school for lab, administration, and some classrooms. Some shared resources and some secure storage space. Minimum 10/100 Mbps Cat 5 hubbed network.	Most rooms connected to Internet via WAN and wireless connectivity where possible at each school with student access. Minimum 10/100 Mbps Cat 5 switched network. Basic servers for sharing some resources at each school.	All rooms connected to Internet with significant wireless connectivity at each school with sufficient bandwidth for effective student access. Minimum 100 Mbps Cat 5e switched network. District-owned servers or cloud computing provides secure storage, backups, applications, schedule, email, and website. Students, teachers and parents have easy access to educational resources from home and school (e.g., web portal).	All rooms connected to Internet with significant wireless connectivity at each school with sufficient bandwidth for effective student access. Minimum 100 Mbps/1 Gbps Cat 5e/6 switched network to classroom. Different services (data, phone, video, guest access, etc.) on different virtual LANs. All schools have sufficient bandwidth for content delivery through resources such as video streaming and conferencing. Students, teachers and parents have easy access to educational resources from home and school (e.g., web portal).

Ro w (V)	Focus Areas	Levels of Progress			
		Early Tech	Developing Tech	Proficient Tech	Advanced Tech
	Other Technologies	Shared teacher use of resources such as telephone, TVs, VCRs, DVD players, and classroom sets of programmable calculators.	Shared use of resources such as telephone, computer video projectors, or interactive white boards, classroom sets of programmable calculators, digital cameras, and scanners.	Dedicated and assigned use of common technologies such as telephone, computer video projectors, or interactive white boards. Programmable calculators assigned to each student as needed. In each school, there is shared use of specialized technologies, digital cameras, scanners, handheld electronic devices.	Readily available fully equipped classrooms with computer/video projectors, interactive whiteboard, and other technology to enhance student instruction. Use of new and emerging technologies.

Ro w	Focus Areas	Levels of Progress			
		Early Tech	Developing Tech	Proficient Tech	Advanced Tech
(W)	Safety and Security	Backup and restoration procedures and virus protection to guard individual computers. District-wide acceptable use policy in place.	Basic firewall protection and diligent upgrading of network vulnerabilities added to protect against external threats. Protection against a wide range of malware (viruses, worms, Trojans, rootkits), adware, and spyware. District-wide responsible use policy in place, as well as policy on connecting student/staff-owned devices to school network.	To Developing Tech, add adequate network and server availability protection for expanded capabilities and to ensure dependable access. Protection of workstations from internal network attacks. Encryption of sensitive personal data on local networks. Network supports board policy on connecting student/staff-owned devices (guest devices) on the network.	Usage authentication added for mobile computer and home/external access requirements. Use of virtual LANs (VLANs) to protect network infrastructure and sensitive data. If guest devices are allowed on the network, guest traffic is on an isolated VLAN and/or guest devices are checked for currency of anti-virus software and operating system security patches.

End Notes

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

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

[iii] *Massachusetts STaR Chart (School Technology and Readiness Chart)*, November 2006

[iv] *Massachusetts Technology Literacy Standards and Expectations*, Massachusetts Department of Elementary and Secondary Education, approved by the Massachusetts Board of Education on April 29, 2008, http://www.doe.mass.edu/edtech/standards/itstand.pdf

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

[vi] Based on recommendations the State Education Technology Directors Association (SETDA) in *High-Speed Broadband Access for All Kids: Breaking Through the Barriers* for network speeds in "5-7 years" for a technology-rich learning environment, June 2008, http://www.setda.org/web/guest/2020/broad