2015-2018
District Technology Plan

Manchester Essex Regional School District

January 6, 2015

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EXECUTIVE SUMMARY

This document describes the Manchester-Essex Regional School District's Three-Year Technology Plan. In designing this plan, the District Technology Committee focused on three key areas – infrastructure, curriculum/instruction and professional development – and learned from schools and districts from across the country. Information and resources from the MA Department of Elementary and Secondary Education, the National Research Council, the Bill and Melinda Gates Foundation, GSV Asset Management and the MA Business Alliance for Education all helped to inform this plan.

> *"Students' long-term success is tied to their preparation as lifelong learners, world-class communicators, competitive and creative knowledge workers, and contributing members of a global society." – Shapley, et al. (2011)*

Our Committee was comprised of technology stakeholders within the Essex Elementary School, Manchester Memorial School, Manchester Essex Regional Middle High School, administrators and parents. The Superintendent charged the Committee with designing a plan that would demonstrate the District's commitment to the use of technology in the education of our students. The following members should be thanked for their contributions to this plan:

School Personnel:
Pam Beaudoin, Jeff Bodmer-Turner, Kimberly Field, Erin Fortunato, Steve Guditus, Susan Hardy, Joan Hosman, John Kwiatek, Stephen Kwiatek, Dan Lundergan, Scott Morrison, Jen Roberts, Jenna Seymour, Samantha Silag, John Willis

Parents:
Dierdre Baker, Bill Coale, Eileen Durey, Michelle Kempskie, David Martz

This plan looks forward to the next three years to forecast the necessary steps to reach our goals as the success of our plan will rest on the allocated resources. Funding for the budgetary requirements of the plan will be from the school district's budget, capital expenses, and federal, local and state grants.

Through long-term planning we can spread out resources and still be assured that our programs remain viable. The proposed plan will require additional personnel, hardware, software, materials and training. The Technology Committee is confident that the plan will result in an enhancement of student learning and the enrichment of the programming made available to the students of the District.

> *"Technology requires robust access, adequate technical and pedagogical support, effective professional development and curricular and assessment resources that support the foundational curriculum." – Shapley, et al. (2011)*

VISION

Our vision is for all students to utilize technology to become critical thinkers, effective problem solvers and life-long learners. In a world of rapid innovation and change, technology is the bridge that connects what the National Research Council (2012) identifies as "the three broad domains of competence – cognitive (critical thinking, reasoning, innovation), intrapersonal (flexibility, initiative, metacognition) and interpersonal (communication, collaboration, responsibility)" (p. 16). Consequently, technology integration must be an ongoing, seamless and inherent part of everything we do as educators.

> *"Technology is transforming our lives. The skills needed in the future will be very different from those needed today…education is therefore a key factor in our success." – Barber & Day (2014)*

To realize our vision, the Technology Committee has devised a plan that will strengthen the technology infrastructure, provide targeted professional development and integrate digital learning throughout the school system in order to meet these overarching goals:

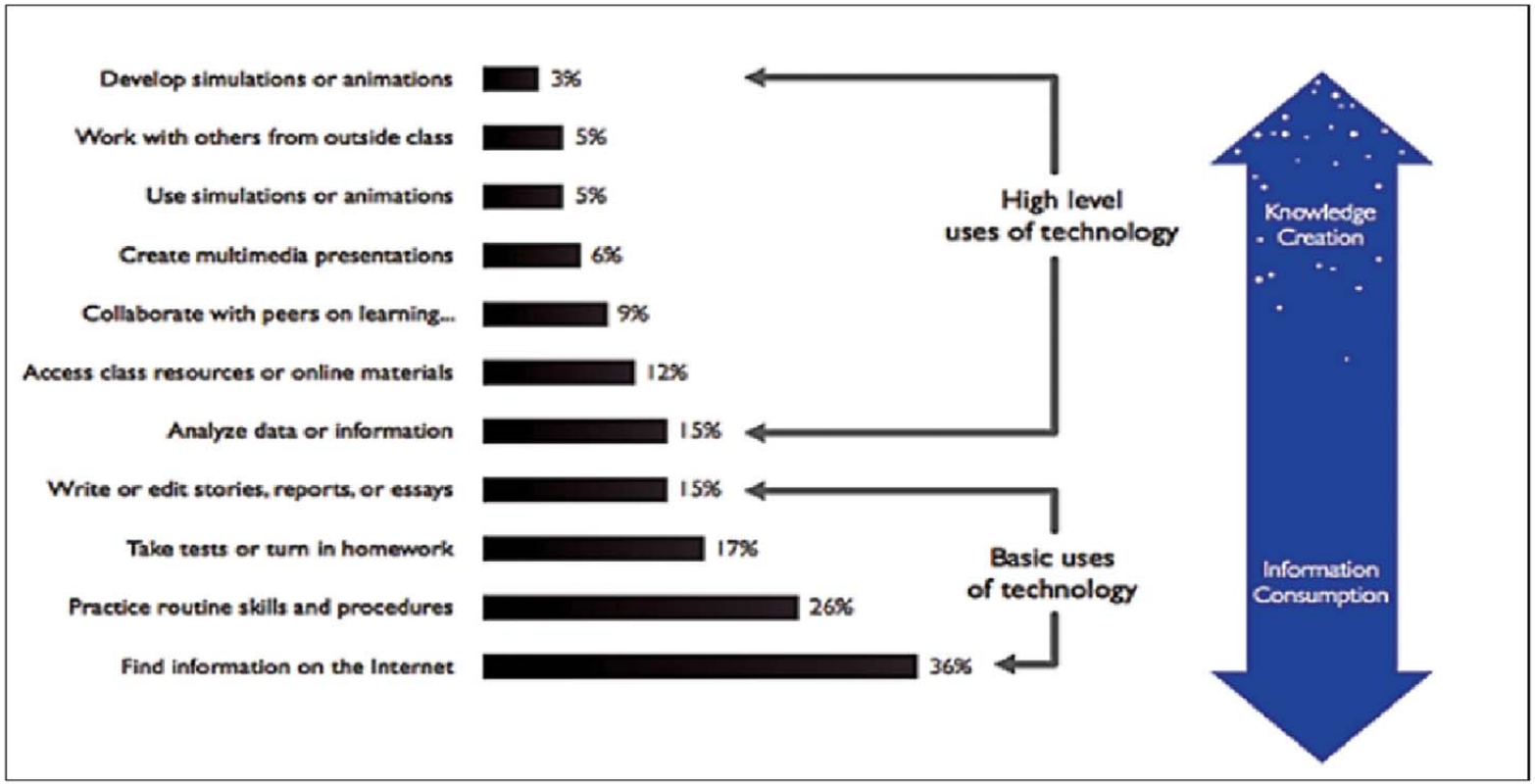
- Students will have access to, and use, technology to enhance learning across the curriculum
- All teachers will have access to, and use, technology to enhance teaching, planning, assessing, reporting, and personal professional development
- The District will provide and support the technology infrastructure necessary to enable adequate video, voice and data communication within and between buildings and to the Internet

- The District will provide adequate financial support to secure and support the necessary personnel and technologies to sustain ongoing new initiatives.

- The District will establish short and long term maintenance, upgrading and acquisition plans for all technology equipment and support materials

- The District will provide faculty and staff training to ensure current and future uses of technology in education

Adoption of technology across international school systems[17]



CURRENT RESOURCES (as of 12/23/14)			
Location	**Personnel**	**Hardware**	**Major Software Titles**
Essex Elementary School	1.0 FTE Technology Integration Specialist	**End-User Devices** • 25 desktop computers - tech lab • 30 laptops on cart • 29 teacher computers (15DT/14LT) • 11 classroom computers (all DT) • 5 Admin support DT (guid/nurse/admin assistant/head custodian) • 1 Admin LT • 20 networked printers • 40 iPads (29 student/11 teacher) • 16 Activboards • 235 Activotes/Expressions • 18 LCD projectors • Lego Engineering materials	• IXL Learning • Enchanted Learning • BrainPop • Go Animate • Type to Learn • Study Island • Noodletools • Learning.com • Google EDU • Microsoft Office • Kidpix • Kidspiration 3.0 • Sibelius 6.0 • ActivInspire • FAST/SPS • Apps for iPads
Location	**Personnel**	**Hardware**	**Major Software Titles**
Memorial Elementary School	1.0 FTE Technology Integration Specialist	**End-User Devices** • 26 desktop computers - tech lab • 30 laptops on carts • 8 Special Ed laptops • 37 teacher computers	• IXL Learning • Enchanted Learning • BrainPop • GoAnimate • Sunburst TypetoLearn • Learning.com

Memorial Elementary School (continued)		• 21 classroom computers • 18 networked printers • 100 iPads • 18 iPad keyboards • 32 document cameras • 27 Activ/Smartboards • 280 Activotes/Expressions • 32 LCD projectors • Lego Engineering materials	• Noodletools • Leaning A-Z • Reading A-Z • FAST • Various iPad Apps • Google EDU • Lego WeDo • Lego RoboLab • Lexia • Everyday Math Online • MS Office 2010
Location	**Personnel**	**Hardware**	**Major Software Titles**
Middle School	N/A	• 30 Comps A117 Lab • 30 Comps Library (shared w/High School) • desktop computers • laptops on cart • teacher computers • classroom computers • 15 networked printers / Faxes • iPads • document cameras • EnoBoards • LCD projector	• MS Office 2010 • Adobe Creative Suite

Location	Personnel	Hardware	Major Software Titles
High School	N/A	• 26 Comps Graphics Art Lab • 22 Comps B231 Lab • 30 Comps B303 • 30 Comps Library (shared w/Middle School) • 24 Teacher computers • 58 classroom computers • 32 networked printers / Faxes • 30 iPads • 18 document cameras • 24 EnoBoards • 40 LCD projectors	• MS Office 2010 • Adobe Creative Suite
District	1.0 FTE Network Administrator 1.0 FTE Network Technician	**<u>Essex</u>** **Server Room:** • Lightspeed Filter **Data Rm 1:** • 1 Camera Switch **<u>Memorial</u>** **Server Room:** • Lightspeed Filter • Network Switch • 1 Camera Switch **Data Rm 1:** • 1 Camera Switch • Network Switch	• Aspen • Ocularis • Naviance • Trackit • School Dude • MS office 2010 • Adobe Creative Suite • BudgetSense • Harpers

		Data Rm 2: • 1 Camera Switch • 4 Network Switches **Data Rm 3:** • Network Switch • 1 Camera Switch **<u>Middle/High School</u>** **Network Closets** **A019** • 1 Network Switch • 1 Camera Switch • S2 Security • Security Server • Sprint In House System • 2 Backup Batteries **B145** • Phone System • Phone Wire Hub • PA System • 4 Network Switch's • 1 Camera Switch • Backup Server • S2 Security • Clock System • 2 Backup Batteries • Sprint In House System **B135** • 2 Network Switch's • S2 Security	

		• Wi-Fi Clock System • 1 Camera Switch • 4 Backup Batteries **A212** • 3 Network Switches • 1 Camera Switch • 2 Backup Batteries **MDF** • Server Rack • 10 HP Server Blades • Core Switch • CX4 Storage System • VNX Storage System • APC Backup Battery System • APC Backup Battery Ext • 1 Camera Switch • Sprint In House System (Core) • Cisco Router • 2 Lightspeed Filter • S2 Security • Barracuda Email Archive • Server Blades • Admin Equipment • Laptops etc • Ipads • Phones • Printers / Faxes	

2014-2015 PILOTS/IMPLEMENTATIONS (as of 12/23/14)				
Location	**Teacher Productivity Tools**	**Student Learning**	**Infrastructure Investment**	**Professional Development**
Essex	ASPEN Report Card ASPEN Gradebook Google Classroom (4^{th}-5^{th}) BrightLoop (2^{nd}-3^{rd})	Google Classroom (4^{th}-5^{th}) FAST Hour of Code	Web filtering Email Server	Google Classroom BrightLoop FAST ASPEN Gradebook Technology Self-Assessment Tool **(Feb. 2015)**
Memorial	ASPEN Report Card ASPEN Gradebook Google Classroom (4^{th}-5^{th}) BrightLoop (2^{nd}-3^{rd})	Google Classroom (4^{th}-5^{th}) FAST Hour of Code	Web filtering Email Server	Google Classroom BrightLoop FAST ASPEN Gradebook Technology Self-Assessment Tool **(Feb. 2015)**

Location	Teacher Productivity Tools	Student Learning	Infrastructure Investment	Professional Development
Middle School	ASPEN Report Card Online Aspen Pages Google Classroom (6^{th}-7^{th})	Google Classroom (6^{th}-7^{th}) Listen Current Hour of code	"New" Computer Lab Web filtering Email Server	Google Classroom Aspen Pages Technology Self-Assessment Tool **(Feb. 2015)**
High School	ASPEN Report Card Online Aspen Pages Google Classroom	Listen Current CAD Intro to Computer Programming Computer Sci. Online Classes Middlebury Interactive(FL) BYU (Math)	Web filtering Email Server Wireless Access Upgraded Router	APSEN Pages Research and develop specifications for a BYOD pilot in the Social Studies department in 2015-2016 Technology Self-Assessment Tool **(Feb. 2015)**
District	ASPEN Online Absence Request ASPEN Gradebook (1^{st}-5^{th})		Exchange Server 2013 Server Blade VMWare Upgrades	Online District Mandated Trainings

K-12 SAMPLE UNITS OF STUDY

(Direct Instruction from Technology Specialist Teacher)

Grade Level	Essex and Memorial
Kindergarten	• Introduction to Drawing/Painting in Kidpix (Multiple Lessons) • Butterfly Symmetry • Mia Reading Adventure (Language/Reading activities in adventure game environment) • Graphs • Nutrition • Introduction to web browsing/Internet rules
1st Grade	• Multiple number sense KidPix Lessons • PLANT (letter sounds in words, navigating KidPix) • Lego Engineering (Engineering Design Cycle; strong structures: walls, corners, chair) • Mapping (finding directions on digital map; KidPix tools: moving objects) • Introduction to Coding (offline and online activities) • Nutrition (Internet web-based interactive site) • Animal Research • Introduction to Internet Safety
2nd Grade	• Mapping the Globe (mapping software, using Google Earth locally) • Continent Landforms (Introduction to PPT, Image search & placement) • Lego Engineering (Engineering Design Cycle; constructing with gears and motors) • President Survey (graphing in Graph Club) • Internet Safety
3rd Grade	• Introduction to Spreadsheets (entering data, assessing results, What if?) • Essex Symbols (Internet image searching, Copyright, multimedia) • Manchester By The Sea Multimedia (Library Collaboration) • Computer Coding & circle geometry

3rd Grade (continued)	• Digital Citizenship (Internet Safety Poster, MS Word Insert images, shapes, text) • Introduction to Keyboarding • Lego Robotics (Constructing/Programming Simple Machines)
4th Grade	• MS Word formatting (managing lists, tabs, fonts, save to server, network printing) • Technology Terminology (Internet searching, managing links in MS Word) • Graphing with Graph Club & MS Excel (Internet data collection, entering data into tables, graph creation) • Computer Coding • Digital Citizenship • Keyboarding (combinations, capitals, special keys, enter key) • Introduction to Google Apps for Education
5th Grade	• Tech Skills Assessment • MS Word formatting • MS Excel (format, formulas, data management) • Technology Terminology II (review and extension) • Digital Citizenship (Internet safety, plagiarism) • Colonial America (research, sourcing, non-fiction writing, multimedia presentation) • Computer Coding • Google Apps for Education (collaboration, research, file management)
Grade Level	**Middle School**
6th-8th	• Not Applicable – No direct instruction
Grade Level	**High School**
9th-12th	• Not Applicable – No direct instruction

TECHNOLOGY GOALS (FY16 – FY18)

The District Technology Committee understands that achievement of the proposed plan is an ongoing process and is subject to modification in the context of an evolving technology landscape. The Committee will report annually on the current status of the goals and recommend adjustments to the three-year plan.

Individual schools may meet these goals at different times. Factors such as building projects, enrollment, funding, hardware, staffing, and networking issues will influence attaining these objectives.

FY16-FY18 Technology Goals

Goals	Timeline	District Improvement Plan Connection	Cost
• Hire a 1.0 FTE Digital Learning Specialist for the Middle/High School	FY16 ↓	• *To establish the District as a leader in innovative and inclusive instructional practices that meet the needs of all learners.*	$ Override
• Hire a 1.0 FTE District Technician to provide hardware, software, and network support		• *Update MERSD's organizational structure to better align positions with organizational priorities.*	$ Override
• Wireless network upgrades at the High School and Middle School			$ Grant and…
• Replace B231 Computer "Fat" Lab		• *Create meaningful opportunities for student demonstration/mastery of 21st century skills.*	$ Lease
• Replace A139 Computer "Fat" Lab			$ Lease
• Replace elementary laptop carts			$ Lease

FY16-FY18 Technology Goals			
Goals	**Timeline**	**District Improvement Plan Connection**	**Cost**
• Implement a pilot BYOD program within the High School Social Studies Department • Review newly-developed DESE Computer Science and Coding Standards to determine next steps • Expansion of Google Apps for Education pilot • Expansion of Hour of Code programming • Tier II staff training in ASPEN Pages at the MS/HS • Purchase small number of unique mobile devices at each middle school grade for piloting	FY16 ↓	• *Deliver learner-centered instruction that enables 21st century skills.* • *Commit to continuous improvement in 21st century curriculum design processes.* • *Commit to continuous improvement in 21st century curriculum design processes.* • *Create meaningful opportunities for student demonstration/mastery of 21st century skills.* • *Improve school to home communication by implementing school based outreach.* • *Create meaningful opportunities for student demonstration/mastery of 21st century skills.*	$ $ $ $ $ $
• Expand MS exploratory options both during the day and after school (STEM, Coding, a "21st Century Skills class")	FY17	• *Commit to continuous improvement in 21st century curriculum design processes.*	$

FY16-FY18 Technology Goals

Goals	Timeline	District Improvement Plan Connection	Cost
• Purchase ASPEN LMS • Develop a 21st century skills rubric for use within core classes • New MS/HS ITS begins teaching coding classes for 6-12 • Institute a MS Maker Space or have a "Genius Hour" where students can innovate and create • Replace Thin Client Labs - Media Center (30) - B-303 (30) - B-137 (30) - MS Lab (30) • Replace Elementary "Fat Labs" • Hire 1.0 Digital Learning Specialist at the MS/HS	FY17 ↓ FY18	• *To establish the District as a leader in innovative and inclusive instructional practices that meet the needs of all learners.*	

FY16-FY18 Technology Goals			
Goals	**Timeline**	**District Improvement Plan Connection**	**Cost**
• Expand teachers use of social media for community interaction and to receive their professional development • Install charging stations in the MS/HS • Expand coding opportunities • Expand offerings in Computer Science • Teacher devices • Institute a “Genius Bar” • Promethean Table	FY18 ↓		

BUDGETARY OVERVIEW

		ACTUAL					PROJECTED		
Description	**Leased Item**	**FY-11**	**FY-12**	**FY-13**	**FY-14**	**FY-15**	**FY-16**	**FY-17**	**FY-18**
Capital Hardware Memorial	Laptops	$0	$0	$7,875	$7,875	$7,875	$7,875	$7,875	$7,875
Capital Hardware EEMS	Laptops	$0	$0	$7,875	$7,875	$7,875	$7,875	$7,875	$7,875
Contracted Services	Storage	$0	$0	$15,077	$15,077	$0	$0	$0	$0
Capital Hardware Districtwide	Storage	$0	$0	$0	$0	$5,026	$5,026	$5,026	$5,026
Capital Hardware MERHS	Storage	$0	$0	$0	$0	$5,026	$5,026	$5,026	$5,026
Capital Hardware MERMS	Storage	$0	$0	$0	$0	$5,026	$5,026	$5,026	$5,026
Capital Repairs	Phones	$0	$0	$0	$7,316				
Capital Hardware Memorial	Phones	$0	$0	$0	$0	$3,658	$3,658	$3,658	$3,658
Capital Hardware EEMS	Phones	$0	$0	$0	$0	$3,658	$3,658	$3,658	$3,658
Capital Repairs	Cameras	$0	$0	$0	$20,026				
Capital Hardware Memorial	Cameras	$0	$0	$0	$0	$10,013	$10,013	$10,013	$10,013
Capital Hardware EEMS	Cameras	$0	$0	$0	$0	$10,013	$10,013	$10,013	$10,013
Capital Hardware Memorial	Fat Labs	$0	$0	$0	$0	$0	$0	$3,856	$3,856
Capital Hardware EEMS	Fat Labs	$0	$0	$0	$0	$0	$0	$3,856	$3,856
Capital Hardware MERHS	Computers	$0	$0	$0	$0	$0	$8,000	$19,101	$19,101
Capital Hardware MERMS	Computers	$0	$0	$0	$0	$0	$8,000	$19,101	$19,101
Capital Repairs	**Total**	**$0**	**$0**	**$0**	**$27,342**	**$0**	**$0**	**$0**	**$0**
Contracted Services	**Total**	**$0**	**$0**	**$15,077**	**$15,077**	**$0**	**$0**	**$0**	**$0**
Computer Hardware	**Total**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**
Capital Hardware Districtwide	**Total**	**$0**	**$0**	**$0**	**$0**	**$5,026**	**$5,026**	**$5,026**	**$5,026**
Capital Hardware Memorial	**Total**	**$0**	**$0**	**$7,875**	**$7,875**	**$21,546**	**$21,546**	**$25,402**	**$25,402**
Capital Hardware EEMS	**Total**	**$0**	**$0**	**$7,875**	**$7,875**	**$21,546**	**$21,546**	**$25,402**	**$25,402**
Capital Hardware MERHS	**Total**	**$0**	**$0**	**$0**	**$0**	**$5,026**	**$13,026**	**$24,126**	**$24,126**
Capital Hardware MERMS	**Total**	**$0**	**$0**	**$0**	**$0**	**$5,026**	**$13,026**	**$24,126**	**$24,126**
		$0	**$0**	**$30,827**	**$58,169**	**$58,169**	**$74,169**	**$104,082**	**$104,082**

GLOSSARY

To be completed…

FURTHER READING/SUPPLEMENTARY INFORMATION

Articles

- http://nieer.org/about/people/deborah-stipek
- http://www.scholastic.com/browse/article.jsp?id=3755881
- http://www.eschoolnews.com/files/2014/12/8668-Chromebook-K12-Infographic_v4.pdf
- http://www.wired.com/2014/12/technology-will-revolutionize-education/

Case Studies:

- http://beta.aalf.org/cms/?page=Research%20and%20Resources-%20Research

Digital Literacy/Coding

- https://www.madewithcode.com/
- http://www.doe.mass.edu/STEM/standards.html
- https://www.madewithcode.com/resources?mkt_tok=3RkMMJWWfF9wsRoluavMcu%2FhmjTEU5z16e0pWKK1h5p41El3fuXBP2XqjvpVQcZgPbzJRw8FHZNpywVWM8TILtQYt8FtKAzgAG0%3D
- http://www.marketplace.org/tags/coding
- http://www.edutopia.org/blog/scratch-programming-drawing-2d-shapes-dylan-ryder
- http://www.doe.mass.edu/odl/student.html

Future Ready

- http://all4ed.schoolwires.net/domain/39
- http://www.iftf.org/focus-area/people-technology/
- http://www.onetonline.org/

General Resources

- http://www.cosn.org/Framework
- http://www.ck12.org/

Professional Development/Training/Networking

- http://www.tpack.org/
- http://masscan.edc.org/about
- https://sites.google.com/a/bsdvt.org/one-to-one/professional-development/exemplar-1
- https://www.edx.org/

SOURCES

Barber, M., Day, S. (2014). The new opportunity to lead: A vision for education in Massachusetts for the next 20 years. *Massachusetts Business Alliance*, 1-120.

National Research Council. (2012). Education for life and work: Developing transferable knowledge and skills in the 21st Century. *Committee of Defining Deeper Learning and 21st Century Skills*, 1-204.

Shapley, K., Sheehan, D., Maloney, C., & Caranikas-Walker, F. (2011). Effects of technology immersion on middle school student learning opportunities and achievement. *The Journal of Educational Research*, 104(1), 299-315.

Vinter, S. (2013). *Computing education: Driving the Massachusetts innovation economy* [PowerPoint slides], Legislative Tech Hub Caucus.