NASHOBA REGIONAL SCHOOL DISTRICT

Technology and Digital Learning Plan

2016-2018

Nashoba Regional School District
Technology Committee Members

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Table of Contents

Vision and Mission

VISION

The effective use of technology at Nashoba transforms learning. Learning is self-directed, personalized, differentiated, collaborative and creative. Students have opportunities to make global connections and deepen their understandings and perspectives.

MISSION

Over the next three years, district members will have consistent access to technology:

- *to educate all learners through enhanced communication, collaboration, and organization.*
- *to develop in students the skills, knowledge and independence necessary to become responsible digital citizens.*
- *to confidently, and with integrity encourage students to participate in our global society.*
- *to develop proficient and fluent users of technology.*

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[1] <http://farm8.static.flickr.com/7168/6660144193_6af682b2a2.jpg>

Technology Infrastructure

Over the past twelve years, the NRSD technology infrastructure has undergone several improvements in it's network design as well file storage, backup and communication systems. These design upgrades were implemented in response to the growing demands of our end users and evolving curriculum needs.

Current Infrastructure

The NRSD WAN(wide area network) connections are 1Gbps Comcast fiber links between six buildings and the data center located in the high school. All schools access the Internet through a Comcast Fiber link at the high school. The current Internet bandwidth is 500Mbps.

The LAN (local area network) connections in each building are 1Gbps from workstations to switches, and 1+ Gbps between switches. Currently, we have dedicated wireless access points in all classrooms and commonly shared work areas at the high school and dedicated wireless access points in all 8th grade classrooms to support the 1:1 Chromebook initiative. Based on the results of WiFi survey using Fluke Networks, the district coverage is at 99%. The number of wireless access points in each building is listed in the table below.

School	# Wireless Access Points
Mary Rowlandson	30
Luther Burbank	23
High School	76
Florence Sawyer	35
Emerson Building	9
Center	21
Hale	29

The existing infrastructure supports the current use of technology as well as the planned expansion of the 1:1 Chromebook initiative to Grade 9 in the fall of 2016.

Plan for Infrastructure Improvements

Goal 1: Wide Area Network

To determine the feasibility of Nashoba Regional School District to own a fiber WAN connection between buildings through the eRate competitive bidding process.

Rationale: Currently, Nashoba pays Comcast $12,000 per month for WAN services. Owning our own fiber WAN would eliminate this monthly cost. While an estimated $300,000 intial up front cost would

be incurred, the district would recoup these monies in just over two years time. It is our hope to continue to offset this cost by 50% through the eRate application process. Additionally, a private fiber would allow Nashoba greater flexibility and expansion of our network to support the ever increasing demand of technology use in our schools.

Timetable	Actions	Measure of Success
Summer - Fall 2016	Gain consensus from stakeholders	Consensus gained from community stakeholders
Winter - 2017	Solicit Request for Proposals (following eRate guidelines)	RFP is posted
Sping - 2017	Name a service provider (request funding from USAC)	USAC is notified of vendor selected
Late Fall 2017	Service Provider begins to build following funding committment from USAC	Work has begun
Summer 2018	Fiber Wan installation complete	Nashoba District has access to fiber WAN

Goal 2: Local Area Network / Wireless Network

To provide a robust internal wired and wireless infrastructure for the Nashoba Regional School District.

Rationale: In order to increase the effective use of technology for teaching and learning, a robust local area network is impertive. Fast and reliable connections are critical to support increased usages of technology. It is our hope to offset this cost by 50% through the new eRate modernization order for categrory two services over the next 5 years. The maximum amount that can be budgeted over the five year period of FY15- FY19 is based on student enrollment per building, with a rate of $150 per student. The last year to apply for category 2 services is FY 19.

Category 2 Budget Worksheet

School	Current # Students	Max. Bdgt Per Stdnt	Max. 5yr Bdgt. Allowed	Max. 5yr Rmbrsmnt. Allowed	FY17 Budget	FY 17 Expected Reimb.
Mary Rowlandson	485	$150	$72,750	$36,375	$3986.87	$1,993.44
Luther Burbank	247	$150	$37,050	$18,525	$1901.63	$950.82
Nashoba High	1053	$150	$157,950	$78,975	$45,915.62	$22,957.81
Florence Sawyer	774	$150	$116,100	$58,050	$4870.14	$2,435.07
Center	596	$150	$89,400	$44,700	$11277.60	$5,638.80
Hale	286	$150	$42,900	$21,450	$4716.69	$2,358.35
5 Year Total			**$516,150**	**$258,075**	**$72,668.55**	**$36,334.28**

Timetable	Actions	Measure of Success
Summer 2016	Upgrading cables, switches, and adding and upgrading wireless access points in all buildings with the exception of central offices.	Installations are completed before the first day of school in September 2016
Winter 2017 Summer 2017	Apply for Cat. 2 eRate reimbursement. Upgrading cables , switches, and adding and upgrading wireless access points in central offices.	Fundiing committment recieved. Installations are completed before the first day of school in September 2017
Winter 2018 Summer 2018	Apply for Cat. 2 eRate reimbursement Continue to upgrade and add cables, switches and wireless access points as determined by the firewall, bandwidth shaping and management appliance, surveys and web help desk data.	Funding committment recieved. Usage data and surveys inform next steps

Goal 3: Internet Access

To increase our current bandwidth of 500Mbps to 4000Mbps (4 Gbps) by the fall of 2019.

Rationale: Based on the recommendations from U.S Office of Educational Technology, Nashoba will need to increase Internet bandwidth to 4,000Mbps (4Gbps) in order to sustain expected bandwidth availability with increasing demand. At this speed, 4000 users (all users in the district) could stream a 10 minute high definition video in real time. It is our hope to continue to apply for reimbursement through the eRate program at a rate of 50%.

Timetable

Year	2016	2017	2018	2019
Internet bandwidth increases	500 Mbps	1,000 Mbps	2,000 Mbps	4,000 Mbps

Current Hardware, Software and Supporting Resources

The District Technology budget is funded by the operational budget, eRate and grants when applicable, and community parent organizations. The operational budget funds technology related items such as new and replacement hardware, maintenance and supplies, Internet connections, wireless infrastructures, software and professional development. The annual budget for these items is approximatley $800,000. Although the needs and amounts can vary for the different items, typically 35% is allotted for hardware; 24% for Internet, firewall and backup; 22% for software and 16% for

maintenance, supplies and consulting. For an example detailed budget of all items see the [FY17 budget](#).

The district values access to technology for all staff. Within feasible and sustainable constraints, every effort is made by district administration to provide staff access to the appropriate technology tools and programs needed to complete a job function (e.g., PowerSchool, Infinite Visions, Baseline Edge, Rubicon Atlas, Google Apps for Education). All Unit A staff, administrators and professional staff have access to a desktop or laptop computer. All Unit C staff have access to computing devices in computer labs, libraries and classrooms in their assigned buildings.

Currently, digital resources for students vary by grade level spans and the learning needs. Nashoba makes available developmentally appropriate devices that provide access to a variety of educational programs that align with the curricula and best promote student achievement. All buildings contain computer labs and library media centers that are equipped with desktops and/or Chromebooks for use by all staff and students. The Nashoba Regional High School is equipped with specialized computer labs, devices and software that support instruction in computer programming, computer aided design, graphic arts, social media, Microsoft Office, digital photography and specialized science and math tools.

In order to promote the concept of learning anytime and anywhere, Nashoba began procuring mobile devices for students. iPads for Pre K -2 and special needs students and Chromebooks for grades 3 - 12 students are currently available in each school. In addition, a Bring Your Own Device (BYOD) program in grades 6-12 was initiated in 2013. [Nashoba began a 1:1 Chromebook program with grade eight students in each of the three middle schools in the fall of 2015](#). The current plan is to continue with this program so that in the fall grade 8 and 9 students will have 1:1 Chromebooks and evaluate future options to expand this program in the 2016-2017 school year.

An interactive white board initiative began in the 2006/2007 school year after a pilot in 2005. Currently grades 2 through 8 classrooms have access to interactive whiteboards, and this initiative will continue with grade K and 1 classrooms in the fall of 2016. Under the direction of the Special Education Director, students in our Life Skills, Transitions, and Links programs are provided an iPad as part of a 1:1 program to meet diverse learning needs.

In anticipation of changes in computing devices, Nashoba has been steadily moving towards the utilization of cloud-based programs that function across all platforms. This movement supports access to educational resources from within and outside the walls of the classroom. Some examples of the cloud-based programs that we have adopted are Google Apps for Education (GAFE), content and skills-based programs, multimedia tools and digital reading materials. These online digital resources support opportunities for [blended learning](#).

Plan for Hardware, Software and Support

Goal 4: Budget and Equipment Replacement Cycle

To develop a replacement plan in the fall of 2017 that will allow Nashoba to replace equipment that no longer meets the required function for teaching and learning or productivity.

Rationale: Nashoba strives to replace equipment at rates that match the estimated efficient usability of the device. However, existig budget constraints combined with past increased technology purchases make this challenging.

Measure of Success: By the fall of 2019 Nashoba will have a replacement plan that provides staff with up to date equipment that supports their ability to perform required job functions and effectively integrate innovative and appropriate technology tools and programs into teaching and learning.

FY17 Hardware Replacement Plan

Location	Description of Requests	$317,600	Comments
District			
	1:1 Chromebook for 8th grade	$90,000	purchase with a separated hardware leasing program
	Out of warranty hardware replacement	$40,000	Out of warranty hardware replacement costs for virtual environment servers; network storage, physical server, laptop, desktop, Chromebook, iPad, projector, smartboard and wireless access point
	20-30 Aerohive AP	$11,000	Access point plus 3 year online management
	laptop replacement	$5,400	replace 2011 and earlier models
	laptop replacement	$3,600	extended day positions
Rowlandson			
	laptop replacement	$8,100	replace 2011 and earlier models
	smartboard and projector	$18,000	1st Grade classrooms
	mounted projector	$2,600	Conference Room
	smartboard and projector	$13,500	Kindergarden classrooms
Burbank			
	laptop replacement	$16,200	replace 2011 and earlier models
Sawyer			
	laptop replacement	$13,500	replace 2011 and earlier models
	smartboard and projector	$18,000	1st Grade classrooms
	smartboard and projector	$18,000	Kindergarden classrooms
High School			
	laptop replacement	$2,700	replace 2011 and earlier models
	tablet replacement	$6,000	replace 2011 and earlier models
	desktop replacement	$2,400	replace 2011 and earlier models
	mounted projector	$5,200	music and art room
	CAD Lab	$33,600	need high end video card
Center School			
	laptop replacement	$1,800	replace 2011 and earlier models
Hale School			
	laptop replacement	$7,200	replace 2011 and earlier models
	desktop replacement	$800	replace 2011 and earlier models

Goal 5: 1:1 Mobile Devices

To continue to explore options to expand the 1:1 mobile initiative.

Rationale: A personal mobile device offers students anytime, anywhere access to rich educational resources and 21st century learning experiences that align with the Massachusetts curriculum frameworks. Consistent access to a mobile device ensures that students are provided opportunities to use technology to create, collaborate, communicate and curate information. A 1:1 model enables teachers to regularly guide students in the ethical and safe use of technology and to use digital resources to personalize and self-direct learning. This digital learning model promotes equitable access to curriculum, differentiation of instruction and independent discovery.

Why Chromebook?: The choice of device is a Chromebook for reasons of feasiblity, low maintenance, built-in virus protection, and automatic updates at start up. In addition, NRSD students become familiar with Chromebooks beginning in grade 3 and they offer built-in accessibilty features and other apps that help differentiate learning and address a variety of learning needs. With a seven to ten second start up time, a battery life of 8 to 12 hours, and the ability to work on files offline make this device a "classroom friendly" digital tool. The Chromebooks provide ready access to the NRSD Google Apps for Education's (GAFE) domain where students have access to collaborative and creative productivity tools, as well as other digital resources that the district has adopted.

In late fall, roundtable discussions with grade eight teachers across the District revealed a reported increase in student engagement as well as several other positive outcomes. Teachers stated that their students are able to access information and conduct peer review activities, or collaborate on writing assignments or group projects using online tools more quickly and easily. The mobile devices offer opportunities for students to access educational videos that align with the curriculum and support individualized learning. Grade eight teachers also noted a positive change in planning for digital learning experiences knowing that all students had equal access to resources at any time, as well as a decrease in the need for paper. A survey of teachers and students was conducted half-way through the year.

Some of the highlights from the student survey:
- ninety percent of the students reported that they regularly use the Chromebooks to create or produce a product that demonstrates learning, perform research and work collaboratively.
- sixty percent reported that the use of Chromebooks help them to learn at their own pace.
- fifty-four percent reported that the use of Chromebooks help to understand difficult topics more easily.

Classrooms in the 21st century are evolving and student learning requires a completely different approach in order to meet the demands of the workplace. Adopting 1:1 devices affords our students the access and opportunity needed to find success

Option 1: Continue with current initiative (purchase for grade 8 each year)

Timetable	Actions	Impact on Budget
Fall 2016	● Grade 8 students are issued NRSD purchased Chromebooks ● Grade 9 continues with Chromebooks issued in fall of 2015	FY17 $60, 000
Fall 2017	● Grade 8 students are issued NRSD purchased Chromebooks ● Grade 9 & 10 continue with Chromebooks provided during their 8th grade year.	FY18 $90,000
Fall 2018	● Grade 8 students are issued NRSD purchased Chromebooks ● Grade 9, 10 & 11 continue with Chromebooks during their 8th grade year.	FY19 $90,000 (and each year after that)

Option 2: Continue with current initiative for one more year and then move to "parental purchase" program in the fall of 2017. (This model would allow NRSD to expand the 1:1 program to lower grade levels provided that the planned infrastructure upgrades were completed. In addition, it would allow the Tech Committee to thoughtfully plan a parental purchase program and provide appropriate notice to parents.)

Timetable	Actions	Impact on Budget
Fall 2016 - Winter 2017	● Grade 8 students are issued NRSD purchased Chromebooks and Grade 9 continues with Chromebooks issued in Fall of 2015. ● Tech Committee develops "parental purchase" plan/process and communicates to stakeholders.	FY17 $60,000 (Yr 2 of 1st purchase and Yr 1 of 2nd purchase)
Fall 2017	● Grade 8 students participate in "parental purchase" program. ● Grades 9 & 10 continue with district issued Chromebooks or optionally turn in their NRSD Chromebook and purchase a newer model under new purchase program. ● Chromebooks turned in are re-purposed.	FY18 $30,000 (Yr 3 of 1st purchase and Yr 2 of 2nd purchase)
Fall 2018	● Grade 8 students participate in "parental purchase" program (optional for grade 12) ● Grades 10 & 11 continue with issued NRSD Chromebooks or optionally turn in their NRSD Chromebooks and purchase a newer model. ● Tech Committee reevaluates program to determine possible expansion to lower grade levels. Based on infrastructure and readiness levels of staff and students.	FY 19 $30,000 (Yr 3 of 2nd purchase) (FY20 $0)

Goal 6: Information Systems

To enhance interoperability between data systems, leading to a reduction of redundant data entry and an increase in data integrity. Improve and maintain up to date student information system and servers.

Action	Resource	Timeline	Evaluation of Success
Investigate, evaluate, and identify a service provider that specializes in schools interoperbility framework (SIF) services. Expand SIF to other identified applications used in the district. Upgrade student information system (PowerSchool) to version 9.3 as well as upgrade servers.	Information Management Officer, Budget, Technology Manager	2016-2017 Summer 2016	PowerSchool and the NRSD Active Directory are successfully synced, followed by the online library catalogue. Talent Ed. Eval./Student Analytics program providing it is SIF compatible. Student information is hosted on an upgraded server and running version 9.3.
Investigate and identify an online parent registration service program for the student information system.	Information Management Officer, Budget, Technology Manager	2016-2018	Online student registration and expansion of public portal is implemented. (if feasible)
Pilot PowerTeacher Pro Gradebook with a small focus group to determine benefits and limitations of the new program. (recommended by PowerSchool)	Information Systems Coord, teachers.	2016-2017	Pilot group has identified benefits and limitations to the new program and made recommendation on whether or not to expand to all educators.

Goal 7: Technology Web Help Desk Support

To reduce web help desk response time to maximize the seamless integration of technology in the classroom and increase staff productivity when using technology tools.
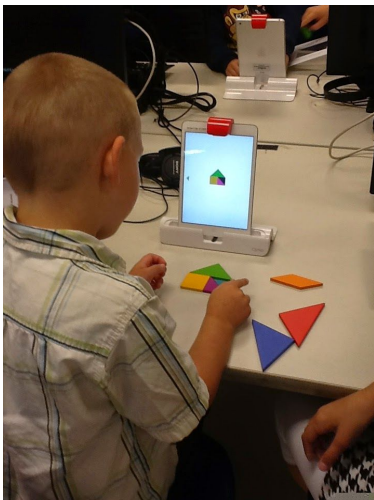
Action	Resource	Timeline	Evaluation of Success
Monitor and anaylze web help-desk reports and make adjustments to processes that decrease response time. Survey staff on level of satisfaction.	IT, ITS and Web Help Desk system, teachers	2016 – 2018 Spring 2016 Spring 2017	Response time will be reduced by 18 % by the end of 2018. (6 day avg. to 5 day avg.) Survey completed Second survey demonstrates increased levels of satisfaction in all schools.

Digital Learning at Nashoba Regional

NRSD Student Expectations for Digital Literacy and Citizenship
As the existing Massachusetts standards for technology were in the process of revision, we chose to align with the International Society for Technology in Education's (ISTE) Standards for students as well as the Common Core standards when designing technology infused curricula. The ISTE standards and the Common Core emphasize research, media literacy, creativity, problem solving and critical thinking. In the 2016-2017 school year we will adopt or adapt the new Massachusetts Digital Literacy and Computer Science standards (adpoted by DESE on June 16, 2016).

The following NRSD grade span expectations were developed by our Instructional Technology staff in accordance with the ISTE standards for students and the Common Core.

Pre-K
Students will begin to explore the main components of a digital device and its use through developmentally appropriate software in a playful environment as well as explore other types of everyday technology.

Grades K-2
By the end of second grade, students will be able to perform basic skills and demonstrate an understanding of the basic functions and applications of a digital device. Students will develop the ability to demonstrate age appropriate responsible use of technology and an understanding of safe online practices that protect their privacy.

Grades 3-5
By the end of fifth grade, students will be able to use digital resources to communicate and collaborate with teachers and classmates to research and create multimedia projects that represent concepts learned in the classroom. Students will demonstrate the responsible use of technology and safe online practices that protect their privacy and respect for others.

Grades 6-8
By the end of eighth grade, students will be able use a variety of digital tools and online resources to communicate, collaboratively problem-solve and create as well as demonstrate age appropriate research skills. Students will demonstrate and be able to explain responsible use of technology both off and online. They will be able to describe and demonstrate the safe and ethical use of online programs.

Grades 9-12
By the end of the twelfth grade, students are engaged, self-reliant learners with the ability to think critically, problem solve and communicate effectively. Students will know how to use a variety of digital tools to research, evaluate, solve problems and make decisions connected to real world applications. At the end of twelfth grade, students need to understand and practice ethical responsibility as they prepare for college, career and life-long learning.

Framework for Designing and Implementing Digital Learning

According to the Alliance for Excellent Education,

> "Digital learning is any instructional practice that effectively uses technology to strengthen a student's learning experience. It emphasizes high-quality instruction and provides access to challenging content, feedback through formative assessment, opportunities for learning anytime and anywhere, and individualized instruction to ensure all students reach their full potential to succeed in college and a career."

These are practices that we strive to accomplish at Nashoba when using our digital resources.

An excellent model to gauge our effectiveness in strengthening our students' digital learning experiences is the **Substitution, Augmentation, Modification and Redefinition (SAMR) model** developed by Dr. Ruben Puentedura in 2006, in collaboration with the Maine Dept. of Education. This model supports and guides teachers in progressing from the use of technology for enhancing the curriculum to transforming the learning when designing and developing digital learning experiences that require students to modify and redefine content. When students use technology to redefine and modify their learning they are developing communicative, technological and collaborative skills that will prepare them for college and career.

It is the design of the curriculum and purposeful use of technology that transforms learning. Using the SAMR model, the figure below depicts two examples of digital learning using existing digital resources and current practices at Nashoba. In this model, the examples "above the line" indicate when teaching and learning is transformed by requiring students to engage in rich cognitive tasks through the use of technology.

Examples of Digital Learning at Nashoba using the SAMR Model

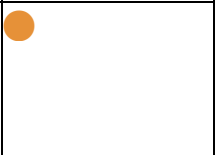|		
REDEFINITION • Technology allows for the creation of new tasks, previously inconceivable	Use Skype to connect with students that live along the route of the main character's journey to learn from primary sources.	Using choice online tools students collaboratively research, share ideas with experts, create and publish a multi-media report.
MODIFICATION • Technology allows for the significant task redesign	Use the information gleaned from the journey in Google Earth and write a published blog to demonstrate knowledge gained.	Take research notes on a Google Doc, use the research tools and share the document with the teacher and other students for comments and peer review.
AUGMENTATION • Technology acts as a direct tool substitution, with functional improvement	Use Google Earth tools to add pictures and links to the journey of a main character in a book.	Take research notes on a Google Doc, use the research tools and share the document with the teacher.
SUBSTITUTION • Technology acts as a direct tool substitute, with no functional change	Use Google Earth to trace the journey of a main character in a book.	Take research notes on a word processor.

(TRANSFORMATION applies to REDEFINITION and MODIFICATION; ENHANCEMENT applies to AUGMENTATION and SUBSTITUTION)
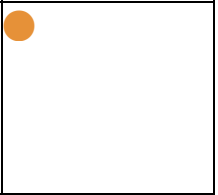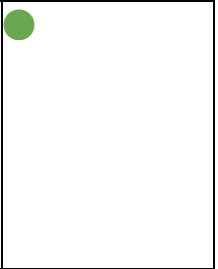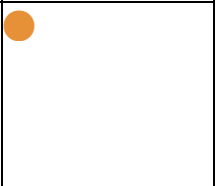
Goal 8: Teaching and Learning

To design and implement technology infused instruction and practices that transform teaching and learning so that all students can achieve their highest potential and are prepared for college and career.

Action	Resource	Timeline	Evaluation of Success
Survey educational staff to determine areas of need / improvement for professional development in digital learning.	Digital Learning Coord. Tech Committee	Spring 2016	Data has been gathered and analyzed. Areas of need / improvement are identified.
Design and provide opportunities for professional development in digital learning that focus on identified areas of need according to the survey as well as supporting a 1:1 mobile device learning environment in appropriate grade levels.	Digital Learning Coord. Instructional Technology Teachers Identified teachers in buildings that demonstrate the ability to model instructional strategies in digital learning	2016-2018	At least twelve digital learning professional development opportunities are offered between 2016 - 2018 (6 per school year) and are attended by at least 50% of Unit A staff each school year.
Teaching & Learning, Administrators and Instructional Technology teachers utilize the SAMR framework model as a reference when working with or supporting teachers in designing curriculum that embeds digital learning for the purpose of ensuring that the use of technology in the classroom is supporting learning.	Rubicon Atlas Staff Start Page Instructional Technology Teachers Teaching & Learning Administrators SAMR Model & Exemplars	2016-2018	Evidence of at least one exemplar, at each grade level / content area in each school building will reflect the modification and redefinition of learning through the use of technology A "SAMR Showcase" site will be developed to serve as a repository for digital learning District-wide K-12.
Elementary teachers are supported with the integration of technology tools available in the K-5 math program and in the revised science curriculum.	Digital Learning Coord. Elementary Technology Teachers STEM Coord.	2016 - 2018	Elementary teachers are using the technology tools available in math and science routinely as evidenced through observations and teacher reporting

Appendix A

Massachusetts Department of Elementary and Secondary Education Technology Planning Recommended Benchmarks and NRSD Status

The Massachusetts Department of Elementary and Secondary Education designed a set of guidelines to help districts effectively plan for the integration of technology into teaching and learning. The recomended benchmarks are for the 2014-2015 school year. The table below depicts DESE's suggested benchmarks and the status at NRSD and was carried over from the NRSD 2014 Technology Plan. Over the 2015-2016 school year DESE's Office of Digital Learning has updated its resources and no longer uses these benchmarks. In the 2016-2017 school year NRSD Technology Committee members will research these new resources offered by DESE.

Massachusettes DESE Recommended Benchmarks	Resources	●Planning ●In Progress ● Meets ●Exceeds
Benchmark 1: Commitment to a Clear Vision and Implementation Strategies		
A. The district's technology plan contains a clearly stated and reasonable set of goals and implementation strategies that align with the district-wide school improvement plan.	Technology Staff, Administrative Leadership Team, Technology Committee	●
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 support of the district leadership team.	Technology Committee is comprised of administrators, teachers and school committee members	●
C. Needs Assessment		
1. The district assesses the technology products and services that will be needed to improve teaching and learning.	Teaching & Learning reviews all programs and materials to ensure alignment with curriculum.	●
2. The technology plan includes an assessment of the services and products that are currently being used and that the district plans to acquire.	Tech Support staff meet regularly to evaluate hardware and network systems in place and investigate or pilot emerging technologies and services. Teaching and Learning tracks usage data and effectiveness of programs.	●
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. .	District operating budget	●

2. The budget includes staffing, infrastructure, hardware, software applications, professional development, support, and contracted services.	District operating budget	🟠
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.	District operating budget, Parent Organizations, grants and E-rate when applicable	🟠
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.	Adequate funding is requested from local municipalities for non-discounted portions of services and included in the operating budget	🟠
F. Evaluation		
1. The district routinely consults with technology staff before purchasing technologies items, to ensure that the items are appropriate, cost-effective, and sustainable.	Proposals and requests from staff are submitted to Teaching & Learning and IT Staff through the WebHelp Desk system.	🟢
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.	ITS staff,Tech Support staff, Leadership team, Dept. of Teaching and Learning and Technology Committee	🟢
Benchmark 2 Technology Integration and Literacy		
A. Technology Integration		
1. Outside Teaching Time - At least 90% of teachers use technology every day, including some of the following areas: research, lesson planning, organization, administrative tasks, communications, and collaboration. Teachers explore evolving technologies and share information about technology uses with their colleagues.	All FTE teachers have a laptop to perform daily administrative tasks and communicate. All staff have access to shared folders and forums on a private network and where curriculum materials are stored and distributed.	🔴
2. For Teaching and Learning - At least 90% of teachers use technology appropriately with students every day to improve student learning of the curriculum. Activities include some of the following: research, multimedia, simulations, data analysis, communications, and collaboration. Teachers integrate evolving technologies that enhance student interest, inquiry, analysis, collaboration, and creativity.	All teachers have laptops that they use for instruction and are provided projectors and resources to digital curriculum materials that contain engaging and enriching forms of instructional mediums. Students have access to technologies in each building. The SAMR model will be used to guide and assess effective uses of technology for instruction.	🟢
B. Technology Literacy		

1. At least 90% of eighth grade students show proficiency in all the Massachusetts Technology Literacy Standards and Expectations for grade eight[1].	ITS and Teaching and Learning are creating common assessments for grade 8. Researching online ready made assessments.	🟢
2. 100% of teachers are working to meet the proficiency level in technology, and by the school year 2014-2015, 90% of teachers will have mastered 90% of the skills in the Massachusetts Technology Self-Assessment Tool (TSAT).[1]	ITS and Library Media staff offer professional development opportunities throughout the year as well as just-in-time learning to assist with this benchmark. The perferred benchmarks are NETS for Teachers.	🟢
C. Staffing		
1. The district has a district-level technology director/coordinator.	Yes	🟠
2. The district provides one FTE instructional technology teacher per 60-120 instructional staff.	1 FTE ITS per 60 instructional staff Note: (3 ITS teach scheduled classes K-5)	🟠
3. The district has staff specifically dedicated to data management and assessment.	Yes	🟠
Benchmark 3 Technology Professional Development		
A. At the end of five years, at least 90% of district staff will have participated in high-quality, ongoing professional development that includes emerging technology issues, technology skills, universal design, and research-based models of technology integration. .	Professional development is offered each year in the form of "just-in-time" in buildings, after school, online and during release time by ITS, Digital Learning Coordinator and lead teachers.	🟢
B. Technology professional development is sustained and ongoing and includes coaching, modeling best practices, district-based mentoring, study groups, and online professional development.	ITS and Library Media staff offer professional development opportunities throughout the year on a variety of technology integration techniques and tools. They are building based and available to assist or model in classrooms. Many of our teachers take advantage of what is offered in the district and the surrounding area.	🔴
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.[1]	PD surveys are solicited through our PD committee and includes technology as well as the technology committee. We plan to use the SAMR model beginning in 2016 and expand the introduction of it's use in 2017.	🟢
D. Administrators and teachers consider their own needs for technology professional development.[1]	Yes.	🟠

Benchmark 4 Accessibility of Technology		
A. Hardware Access		
1. By 2014-2015, the district has an average ratio of one high-capacity, Internet-connected computer for each student. (The Department will work with stakeholders on a regular basis to review and define high-capacity computers.)	The current ratio is approx. 2 to 1. High capacity needs to be defined. Teaching and learning needs can be met with mobile devices such as iPad and Chromebook. Chromebook 1:1 initiative will be implemented in Fall 2015.	🟢
2. The district provides students with emerging technologies appropriate to their grade level.	In addition to grade level we base our provisions for students by learning needs.	🟠
3. The district maximizes access to the general education curriculum for all students, including students with disabilities, using universal design principles and assistive technology devices.	Labs, wireless carts and digital devices in libraries are accessible to all students. Assistive technologies devices are used when appropriate or required.	🟠
4. The district has procurement policies for information and instructional technologies that ensure usability, equivalent access, interoperability and SIF compliance[1].	Our Web Help Desk system contains technology request forms that are reviewed, vetted and approved by the Technology Manager and Dept. of Teaching and Learning.	🟢
5. The district provides technology-rich classrooms, with access to devices such as digital projectors, electronic whiteboards, and student response systems.	All computer labs and most libraries are provided with projectors. Interactive white boards are provided in grades 2 - 8 with a plan to continue with grades K - 1. We utilize student some response systems and take advantage of new online response programs that can be used with any mobile device and provide instant and interactive feedback.	🟠
6. The district has established a computer replacement cycle of five years or less.	We strive for a 5 year replacement cycle for staff devices and 5 to 6 year replacement cycle for computer labs.	🟢
B. Internet Access		
1. The district provides connectivity to the Internet in all classrooms in all schools including wireless connectivity.	Yes	🟠
2.The district provides an external Internet connection to the Internet Service Provider (ISP) of 100 Mbps per 1,000 students/staff.[1]	Plan to increase to 1000Mbps for 4000 users by the summer of 2017	🟠

3. The district provides bandwidth of at least 10/100/1 Gb to each classroom. At peak, the bandwidth at each computer is at least 100 kbps. The network card for each computer is at least 10/100/1 Gb	Our internal bandwidth to classrooms are 100/1000 Mbps based, Most of the network cards are 100Mbps and 1Gbps based.	🟠
C. Networking (LAN/WAN)		
1. The district provides internal wide area network (WAN) connections from the district to each school between schools of at least 1 Gbps per 1,000 students/staff.	Technology Manager, eRate	🟠
2. The district provides access to servers for secure file sharing, backups, scheduling, email, and web publishing, either internally or through contracted services.	Technology Manager	🟠
D. Access to the Internet Outside the School Day		
1. The district provides access to its computer labs before and after school to ensure that students and staff have adequate access to the Internet outside of the school day.	Library Staffing and other staff	🟠
2. The district disseminates a list of up-to-date list of places where students and staff can access the Internet after school hours.	Building staff , ITS, Librares	🟠
E. Staffing		
1. The district provides staff or contracted services to ensure that its network is functioning at all times.	Technology Support Staff and Contracted Services	🟠
2. The district resolves technical problems within 24 hours, so that they do not cause major disruptions to curriculum delivery. The district provides clear information about how to access technical support, which can be provided in person or remotely.	WHD ticket system available to all staff tracks all issues and status. While the type of ticket determines time it takes to resolve a ticket, the vast majority of tickets are responded to within 24 hours.	🟢
3. The district provides at least one FTE person to support 400 computers. Technical support can be provided by dedicated staff or contracted services.	4 Tech Support staff per approx. 2000 computers	🟠
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.	100% of teachers have online educator websites that contain links to online resources, learning expectations, homework and assignments. The recent implementation of Google Classroom provides the opportunity for grades 3-12 teachers to develop course	🟢

	assignments, assessments and resources interactively online.	
B. The district deploys IP-based connections for access to web-based and/or interactive video learning on the local, state, regional, national, and international level.	Technology Support Staff	🟠
C. Classroom applications of virtual learning include courses, collaborative projects, field trips, and discussions.	We use websites for virtual field trips and use online programs to connect with professionals or other students outside the classroom for instructional purposes. The addition of the Google Apps for Education has increased collaboration, feedback and sharing immensely.	🟠
D. The district maintains an up-to-date website that includes information for parents and community members.	http://www.nrsd.net	🟠
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.	Policy Sub Committee	🟠
B. The district educates teachers and students about appropriate online behavior. Topics include cyberbullying, potential risks related to social networking sites and chat rooms, and strategies for dealing with these issues.[1]	Instructional technology and health teachers, local district attorney's office.	🟠
C. The district has a plan to protect the security and confidentiality of personal information of its students and staff.[1]	NRSD uses password protection and all data in online programs are encrypted.	🟠
D. The district complies with federal and state law[1], 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.	Internal data backup occurs nightly. Online resources are backed up in real time by service providers. Online Communications Policy. New teacher orientation includes professional development on this topic.	🟠

Appendix B
1:1 Plan for Nashoba Regional School District

Rationale - A personal mobile device offers students anytime, anywhere access to rich educational resources and 21st century learning experiences that align with the Massachusetts curriculum frameworks. Consistent access to a mobile device ensures that students are provided opportunities to use technology to create, collaborate, communicate and curate information. A 1:1 model enables teachers to regularly guide students in the ethical and safe use of technology and to use digital resources to personalize and self-direct learning. This digital learning model promotes equitable access to curriculum, differentiation of instruction and independent discovery. It is important that we provide authentic and enriching learning experiences through the use of digital tools that students will be expected to use effectively and efficiently for research, innovation and problem-solving in future educational opportunities and careers.

Grade Level and Device - Nashoba's 1:1 rollout will begin with grade eight students in each of the three middle schools in the fall of 2015. The choice of device is a Chromebook for reasons of sustainability, familiarity, a quick start up, long battery life, and ready access to Google Apps for Education (GAFE) and other digital resources that the district has adopted. In the fall of 2015 our grade eight students will have been using a Chromebook for two years and are in daily contact with core content area teachers that are familiar with the device and GAFE. They will be able to readily seek assistance from multiple educational staff in the building. During the grade eight school year students will receive guidance on the responsible use of a personal mobile device for learning preparing them for academic requirements at the high school.

Infrastructure – The wireless configuration in each middle school building, as well as the high school, has been assessed and upgraded. This part of our infrastructure is monitored and updated as needs arise so that each student will be able to use a personal computing device. Our internet bandwidth has been increased from 200 Mbps to 500 Mbps in July of 2015. These steps will vastly increase our capacity to connect to the internet ensuring a more robust and reliable network. To support this initiative, the electrical system has been reviewed to ensure that it is capable of supporting school wide use of technology. There are spaces available in classrooms and libraries that will allow for charging stations.

Technology Purchases - The projected costs will include approximately $65,000 per year for hardware for a five year cost of $325,000. After this initial investment a replacement cycle budget will be developed. Offsets from paper savings and textbook savings will be used to partially fund this initiative.

Professional Development - While the district has provided technology focused workshops for all staff throughout the years, targeted professional development for middle and high school teachers began during the 2015 summer academy. Professional development will continue during release time, after-school workshops, online, and when requested in the classroom. It will focus on strengthening student's learning experiences through the effective use of digital tools for teaching and designing curriculum. Teachers will be supported in creating authentic learning experiences that require students to research, analyze and problem-solve. Professional development will address organizing and managing classroom assignments and digital materials, and technology-based assessments that inform instruction and provide feedback to students. Digital learning will continue to be a focus in

subsequent years so that teachers have time to transform their teaching practices and strengthen student learning through the use of technology.

Student access – All students are entitled to equal access to computing devices not only to enhance their learning but to prepare them for college and careers. An important document, a research based white paper, written primarily by staff Kristen Piggott and Steve Svetlik of Township 113 School District, outlined the role of technology as a learning tool and provided specific recommendations pertaining to planning and implementing technological purchases. Click here to see the document.

We envision technology as a learning tool that fosters skills necessary for our students to be career and college ready. We recognize that technology enhances the connection between teaching and learning. We also understand that technology is most effectively used when teachers have consistent access to meaningful, ongoing, and curriculum-specific professional development in its application. Through proper implementation of technology, all students will have greater access to the curriculum, and teachers will have a wider array of methodologies to use in the delivery of instruction. Technology also provides for a more-developed source for communication between parents/guardians, teachers, students, and the greater district community.

Students will be expected to use the Chromebooks to collaborate, communicate, create, and curate in each class as directed by their classroom teachers. Students are expected to bring their Chromebook fully charged to school each day. Each teacher will have discretion as to why, how, and when they ask students to integrate with technology. Assessments may be given using the devices as well. Paper and pencil tasks will still be part of the everyday experience, but over time, we would expect final products to be created using technology.

Next generation assessments is directly relevant to the Chromebook 1:1 Adoption Plan because this assessment is designed to be delivered electronically on a computer. The current lab capacity would make implementation of the online assessments for our students extremely challenging in terms of scheduling. Adopting the 1:1 Chromebook plan for eighth graders would eradicate this concern.

We recommended using the Chromebook device as a learning tool for incoming eighth grade students next school year, 2015-2016. It has been a mainstay of our technology tool for the past three years. The Chromebook will be the property of the district and it will be brought back and forth between home and school. Students will be allowed to keep the Chromebooks during the summer and return the Chromebook upon graduation. Just like textbooks, devices that are lost or damaged will have to be replaced by the parents or guardians. We will build into our order number a 10% overstock of devices so that students may secure a "loaner" when necessary.

The Chromebook device was selected for many reasons, but the primary considerations were effectiveness, cost, application options, keyboard access, battery life, deployment and security.

E book Options -The District has actively investigated the opportunity to move away from hardbound textbooks and to move toward digital options. A number of classes have within the last few years adopted digital texts. We continue to investigate these curricular materials. We can not at this time promise that paying for half the cost of a personal Chromebook can for certain be recouped with a change in these adopted materials. However, we are working diligently to find viable alternatives in order to negate the impact of a cost-sharing fee. We need to maintain an appropriate priority; specifically, the match between course targets and the selected instructional materials will remain the primary driver of this decision, not the format of the material.

Frequently Asked Questions - To prepare to communicate the adoption of a 1-1 Chromebook plan, we have taken a number of steps. We have released stories about the importance of effectively integrating technology in our classrooms today. We have also drafted a document outlining anticipated Frequently Asked Questions (see draft by clicking here). We have established a website that allows parents or students to pose their own questions and intend to be responsive to these inquiries on this site (when we make it a live site).

Program Evaluation - Communication with stakeholders is vital. At the end of each school year feedback will be sought from grade 8 teachers and students as we monitor and respond to needs throughout the year.   A parent information night will be planned at each school to review the device and expectations of its use by students and to answer questions and at the end of the year we will build questions into the school council survey to capture feedback from all stakeholders for planning purposes. We will also provide a pre and post assessment during this school year to monitor progress over time.

Timeline
Year One: 2015 - 2016
- Chromebooks disseminated to each Grade 8 Student*
- Professional Development focusing on Digital Learning for all educators
- Eighth Teachers will be supported with training on the use of Chromebooks and using technology to strengthen student learning experiences
- Digital Citizenship lessons and assessment for Eighth Grade Students
- Embedded Student use of Technology in Teacher Designed Lessons
- Program Evaluation

Year Two: 2016 - 2017
- Chromebooks disseminated to each Grade 8 Student*
- Professional Development focusing on Digital Learning for all educators
- All High School Teachers will be supported with training on the use of Chromebooks and using technology to strengthen student learning experiences
- Digital Citizenship lessons and assessment for Eighth Grade Students
- Embedded Student use of Technology in Teacher Designed Lessons
- Program Evaluation

Year Three: 2017 - 2018
- Chromebooks disseminated to each Grade 8 Student*
- Professional Development focusing on Digital Learning for all educators
- Continued training for grades 3 -12 educators on the use of Chromebooks and using technology to strengthen student learning experiences
- Digital Citizenship lessons and assessment for Eighth Grade Students
- Embedded Student use of Technology in Teacher Designed Lessons
- Program Evaluation

Year Four: 2018 - 2019
- Chromebooks disseminated to each Grade 8 Student*
- Professional Development focusing on Digital Learning for all educators
- Digital Citizenship lessons and assessment for Eighth Grade Students
- Embedded Student use of Technology in Teacher Designed Lessons

- Program Evaluation

Year Five: 2019 - 2020
- Chromebooks disseminated to each Grade 8 Student*
- Professional Development focusing on Digital Learning for all educators
- Digital Citizenship lessons and assessment for Eighth Grade Students
- Embedded Student use of Technology in Teacher Designed Lessons
- Program Evaluation

*Prior to dissemination of the Chromebooks the following actions must occur
- Signed parental consent must be collected
- A digital citizenship lesson and assessment must be delivered to the students
- Review of the procedures and guidelines with students