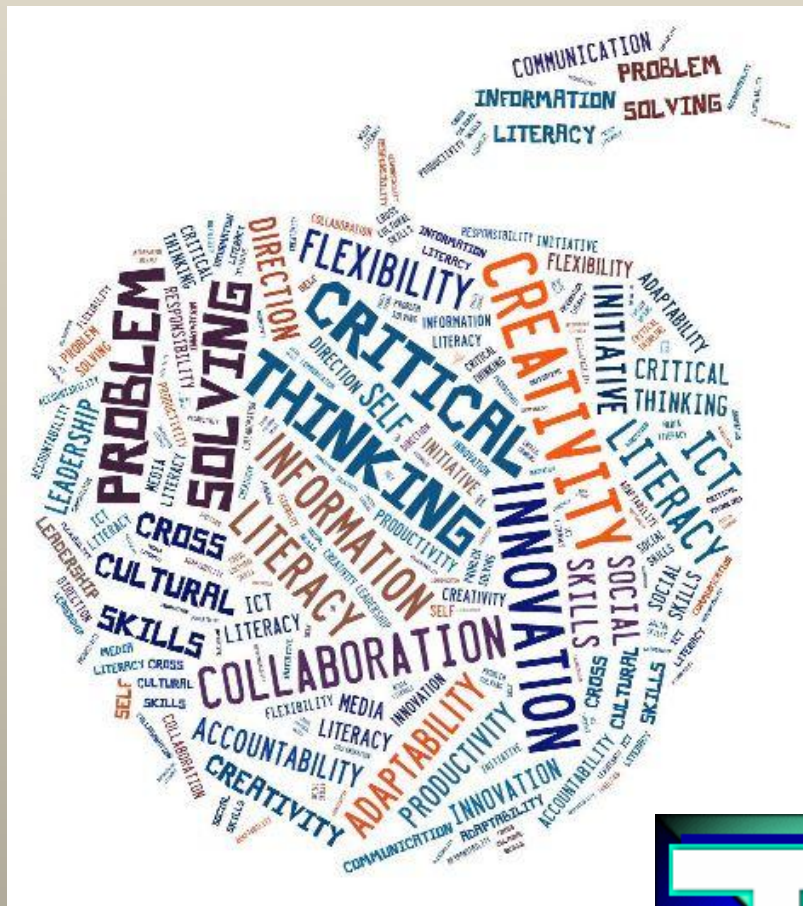# Timberlane Regional School District

School Administrative Unit #55

Technology Plan
2012-13 through 2014-15

"Fostering 21st century skills through effective technology integration"

Timberlane Regional School District

District Technology Plan
2012-13 through 2014-15

Approved by the TRSD School Board on June 21, 2012

Contents

Introduction

2011-12 District Technology Committee

Name	Title
Peter Bealo	School Board Representative
Wendy Bibeau	Teacher, High School Business Department
Patricia Collins	Media Specialist, Pollard School
Nicholas Delfino	HS Student Council Representative
Patricia Fogarty	Teacher, Pollard School Technology
Linda Heuer	District Technology Coordinator
John Holland	District Technology Director
Beth Kisiel	Media Specialist, Danville Elementary
Matthew McCabe	Teacher, Middle School Social Studies
Kathleen McKechnie	Preschool Coordinator
Lois Paul	Technology Integration Specialist
Betti Percival	Technology Specialist
Christopher Snyder	Assistant Principal, Atkinson Academy
Jennifer Toth	Media Specialist, Atkinson Academy

District Mission Statement

The mission of the Timberlane Regional School District is to engage all students in challenging and relevant learning opportunities, emphasizing high aspirations and personal growth.

Demographics

The Timberlane Regional School District includes a High School, Middle School, five Elementary Schools, and a Performing Arts Center. The District is part of School Administrative Unit #55 and serves the towns of Atkinson, Danville, Plaistow, and Sandown. These towns are located in the southeast region of the state. K-12 student enrollment as of October 1, 2011 totaled 4,162. Please visit our website at www.timberlane.net.

Technology Vision Statement

The Timberlane Regional School District is committed to applying technology resources in an integrated approach to support learning in all subject areas, and to provide students with the knowledge, skills, and expertise to succeed in work and life in the 21st century.

Scan the QR code to view a short TRSD Technology montage video

Goals

21st Century Skills Literacy

A solid foundation of 21st century skills is essential to succeed in today's global marketplace and society. The four C's; Critical Thinking, Communication, Collaboration, and Creativity, should be practices that are incorporated into all core subject area curriculum. The overall focus of the TRSD District Technology Plan is to identify and apply purposeful use of technology resources to foster and reinforce 21st century skills literacy for students. "Within the context of core knowledge instruction, students must also learn the essential skills for success in today's world, such as critical thinking, problem solving, communication and collaboration". (P21 Framework for 21st Century Learning, March 2011)

Media Literacy

Media literacy has become an important skill in order to locate, assess, and apply useful information obtained from the myriad amount of data that is found on the Internet and other sources. Students should be taught early on how to conduct effective searches on the Internet to help identify specific information they need. Media literacy is also a valuable skill to have for creating effective presentations and idea maps, using various combinations of video, audio, image, and textual media. Utilizing technologies such as digital cameras, document cameras, and video editing software, students will be able to design and construct project artifacts that demonstrate their own creativity.

Technology Integration

It is the expectation that the District will excel in its technology integration efforts in a way that will not only meet the ICT standards, but will also serve as a "model" of excellence. The District is committed to providing and supporting the necessary elements that support effective technology integration, which include, access to technology resources, technical support staff to maintain resources and infrastructure, technology integration staff, technology professional development for staff, and a technology education curriculum for students.

Emerging Technologies

The educational potential that can be realized from the capabilities of new, emerging technologies is enormous. The District has piloted a number of technology projects that integrate cutting-edge technology to enhance the student learning experience. The District will continue to explore and model emerging technologies such as augmented reality, virtual reality, Web 2.0 collaboration tools, and cloud computing.

Action Plan

Access to Technology Resources

Elementary Schools

- ✓ A network and computers that allow all staff including classroom teachers, support personnel and administrators access to the server for record keeping, data processing, research and curricular purposes.
- ✓ Access to the Internet and SAU databases over high-speed broadband cable.
- ✓ Wireless access in all elementary buildings.
- ✓ A separate wireless network for personal devices.
- ✓ 2 Computer labs in each school with enough computers to accommodate an entire classroom of students.
- ✓ Computers in each classroom that allow all students' access to the server for word processing, research and curricular purposes (5 in Grades 3-5, 2 in Grades 1-2).
- ✓ LCD projectors on carts with a Mobi tablet in every classroom.
- ✓ A set of clickers at every school.
- ✓ Ipevo document cameras in some classrooms.
- ✓ iPads for classroom walk-through assessments.
- ✓ Printers in all classrooms and offices.
- ✓ Color printers in the lab, Art and the Media Center.
- ✓ Scanners in Art, lab and the Media Center.
- ✓ Digital still and video cameras in Media Center.
- ✓ Software to support the curriculum in Language Arts, Math, Science, and Social Studies.
- ✓ Online card catalog with enhanced web connections for local and remote access.
- ✓ Updated High Definition Videoconferencing equipment in some buildings.

Middle School

- ✓ A network that allows all classroom teachers, administrators, and support personnel to access the server for record keeping, data processing, research, and curricular purposes.
- ✓ Access to the Internet and SAU databases.
- ✓ Wireless access throughout the building.
- ✓ A separate wireless network for personal devices.
- ✓ 3 computer labs (25 computers each) for technology instruction.
- ✓ 1 computer lab for use by teachers, small groups, and whole classrooms as needed.
- ✓ Computers and printers in every classroom in building.
- ✓ 1 color printer for every four-person team.
- ✓ Scanners and CD burners in every Grade, computer labs, and library.
- ✓ LCD projectors in all classrooms and the Media Center.
- ✓ 10 mobile wireless labs.
- ✓ Digital still cameras in the technology labs, art rooms, and library for use in the classrooms.
- ✓ Video camera in library for use school-wide.
- ✓ Flip videos available for student and teacher use.
- ✓ Subscriptions for local and remote access to curriculum-related videos and video clips.
- ✓ Online card catalog with enhanced web connections for local and remote access.

- ✓ Software to support all curricular areas.
- ✓ Videoconferencing equipment.

High School

- ✓ A network and computers that allow all classroom teachers, support personnel, athletics, and administrators access to the server for attendance and grading, data processing, research and curricular purposes.
- ✓ Access to the Internet and SAU databases over high-speed broadband cable.
- ✓ Computer labs in Business and Industrial Technology, English, and the Media Center.
- ✓ Computer access in all classrooms.
- ✓ Computer access in department offices.
- ✓ Computer carts in the Science, Social Studies and Math Departments.
- ✓ Computers to support NovaNet and Read 180.
- ✓ LCD projectors in all classrooms and the Media Center.
- ✓ Printers in all department offices and classrooms. Color printers in Business Technology, Art and the Media Center.
- ✓ Scanners, digital video, and digital still cameras in Art and the Media Center.
- ✓ Document camera in Media Center.
- ✓ Software to support the curriculum in Art, Business and Industrial Technology, English, World Languages, Math, Music, Social Studies, and Special Education.
- ✓ Equipment with current technology in the science department.
- ✓ Videoconferencing equipment.
- ✓ iPads for classroom walk-through assessments.
- ✓ Wireless access throughout the building.
- ✓ A separate wireless network for personal devices.
- ✓ Online card catalog with enhanced web connections for local and remote access.
- ✓ 25 Kindles for AP U.S. History

District Office

- ✓ LAN Server
- ✓ PowerSchool Server
- ✓ BudgetSense Server
- ✓ 2 Citrix Servers
- ✓ SharePoint Server
- ✓ Barracuda Firewall
- ✓ 2 scanners
- ✓ 1 color laser printer
- ✓ 5 mono laser printers
- ✓ 15 desktop computers
- ✓ 7 laptop computers
- ✓ 1 projector (ceiling mount)
- ✓ 1 portable projector
- ✓ 1 interactive whiteboard

Distance Learning

Location	Unit#1	Unit #2
Performing Arts Center (PAC)	Tandberg 2500	None
High School	Tandberg 880 on a cart with a Dell 1410X projector and speakers	None
Middle School	Tandberg 990MXP portable media place unit with built in speaker, a high resolution projector and a DVD/VCR. This unit is secured with a lockable Lexan cover panel to protect the system.	Tandberg 2500 in the lab with 2 televisions, 2 cameras, 1 microphone and 1 document camera.
Danville Elementary	LifeSize High Def 220 on a presentation cart with a camera, microphone, HD widescreen Optima short throw projector and speakers	Tandberg 2500 in the DL/Enrichment room with 1 television, 1 camera, 1 microphone and 1 document camera
Pollard School	LifeSize High Def220 on a cart with a camera, microphone, HD Widescreen Optima Projector and speakers	Tandberg 2500 on a cart with a dell projector, 1 camera and 1 microphone.
Atkinson Academy	LifeSize High Def 220 on a presentation cart with a camera, microphone, HD widescreen Optima short throw projector and speakers	Tandberg 2500 in the DL/PLC room with ceiling mounted Projector, 1 document camera, speakers, 1 microphone and 1 camera.
Sandown Central	LifeSize High Def 220 on a presentation cart with a camera, microphone, HD widescreen Optima short throw projector and speakers	Tandberg 2500 in the DL/Enrichment room with 1 television, 1 camera and 1 document camera
Sandown North	Tandberg 2500 in the DL/Library Annex room with 1 television, 1 camera and a document camera	Portable 2500 on a cart with an Epson projector Model H384A Powerlite 96W

✓ TRMS-The Middle School portable unit is used in the classrooms for Distance Learning programs. The Middle School lab unit is used when collaborating between the Middle School and other schools to share projects. The lab is also used if a classroom is not available for a connection.

- TRHS-At the High School we are using the portable unit for classroom distance learning programs and for collaborations between the High School, our Elementary Schools and other school districts.
- TRSD Elementary Schools- The equipment is being used at all schools for programs with providers, and for collaborations in and out of district. The schools that have a LifeSize unit connect from their classrooms, the cafeteria or the library depending on the size of the group.
- PAC- We have used the PAC unit over the past few years for large groups of students to visit with authors and for staff development days so teachers from schools can view trainings without having to drive to the High School.

**Plans for Updating Existing Equipment and Resources:**

- Allocate technology funds and obtain applicable grants that are available for updating existing equipment.
- Allocate technology funds to support and purchase additional videoconference programming connections with Museums, Zoos, and Educational Institutes.

Wide Area Network Architecture

The diagram below shows the MPLS WAN infrastructure currently in place. In addition to the WAN, each school has a broadband cable connection to the Internet, provided by Comcast. Recently, we upgraded the broadband lines at the High School and Middle School to Business Class service to support the growing data and video traffic at those locations.
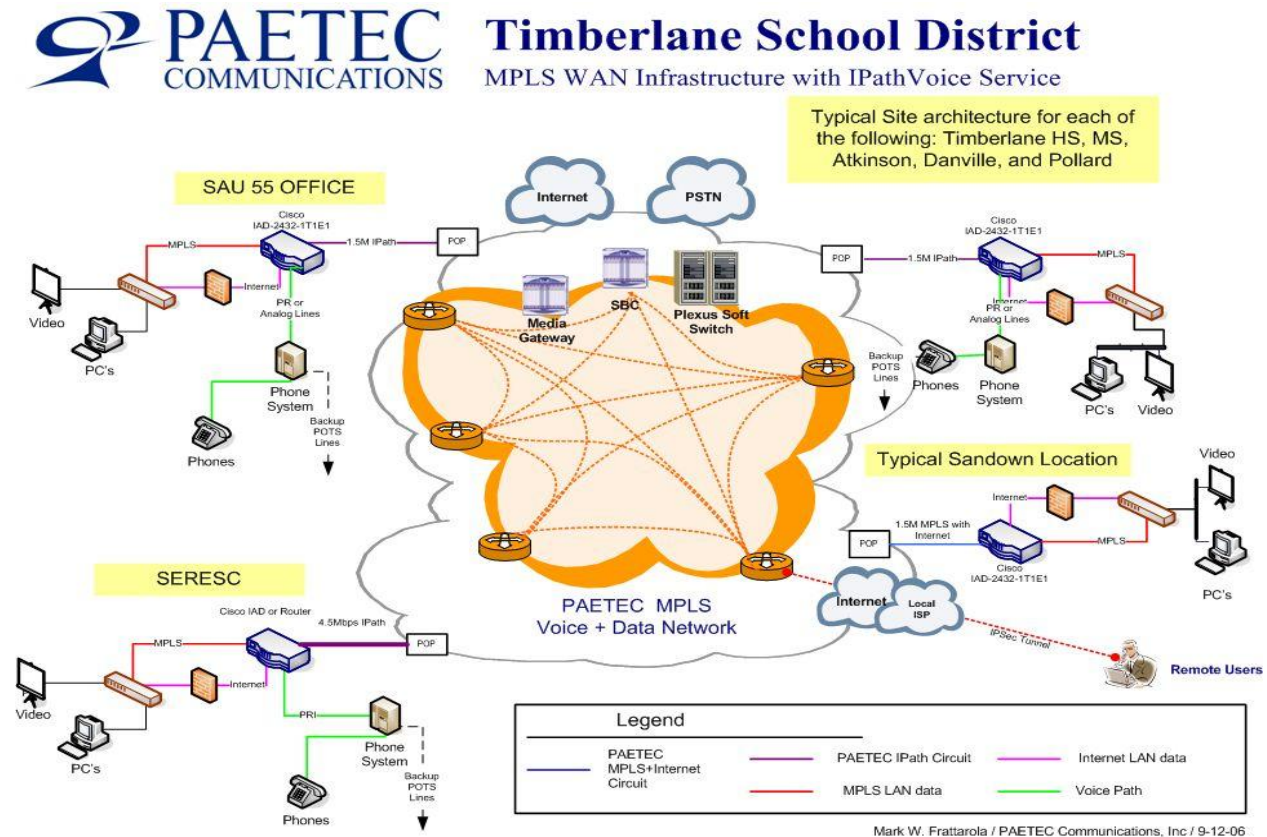
Email Domain Architecture
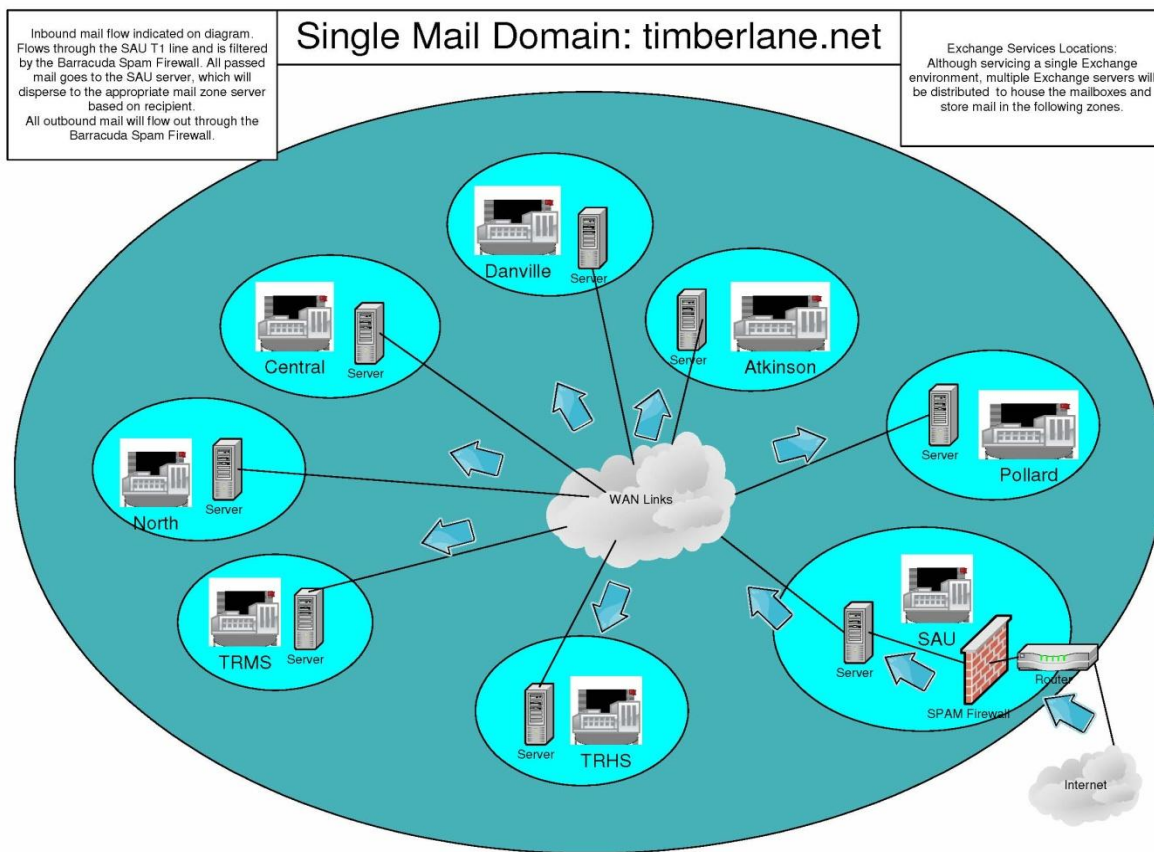
Technology Department Staff

The 2011-12 Technology Department is comprised of a District Technology Director, a District Technology Coordinator, a Network Administrator, 7 Technology Specialists, 2 Technology Integrators, and a Technology Secretary. The Technology & A/V Specialist also maintains the School District websites, and the Timberlane Education Network (TEN).

Role	Location	Schedule
Technology Director	District	Full Year
Technology Coordinator	District	Full Year
Network Administrator	District	Full Year
Technology Specialist	Atkinson Academy/Pollard School	Full Year
Technology Specialist	Danville Elementary	Full Year
Technology & A/V Specialist	District	Full Year
Technology Specialist	Sandown Central/North	Full Year
Technology Specialist	Middle School	Full Year
Technology Specialist	High School	Full Year
Technology Specialist	District Office	Full Year, .75 FTE
Technology Integrator	Secondary Schools	School Year
Technology Integrator	District Distance Learning	School Year, .6 FTE
Secretary	District	School Year

ICT Literacy

Our students are true "digital natives". Technology plays a major role in their daily lives, and they have little difficulty mastering how to use it. In a recent survey, TRSD students were asked: How could your school make it easier for you to use technology? (Speak Up 2011 Grades 3-5 and Grades 6-8 Student Surveys, December 2011). The charts below show the top three categories that had the most responses. The Grades 3-5 chart is based on surveys completed by 692 Elementary School students. The Grades 6-8 chart is based on surveys completed by 70 Middle School students.
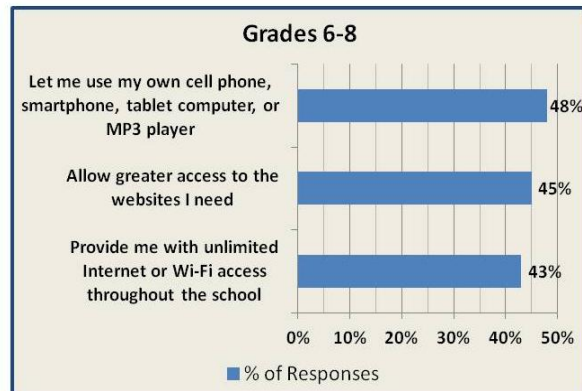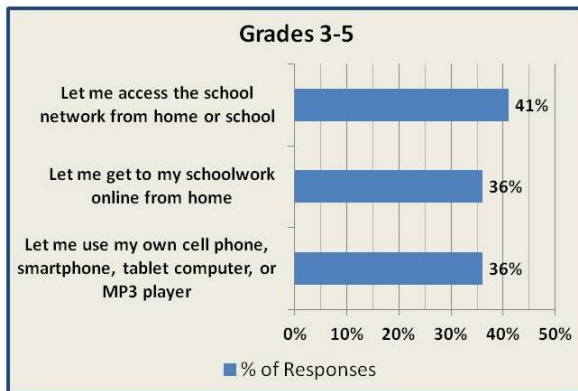
ICT Program

Higher-order thinking skills and digital citizenship are critical to learn to live productively in our emerging global society. The District understands the importance for students to learn 21st century skills in order to be successful in today's modern world. The District is further committed to applying 21st century resources, throughout the context of the core subject areas, as required by NHDOE School Approval Standard Ed 306.42.

Reading
Mathematics
English and Language Arts
Science
Social Studies
Arts
World Languages

The District has adopted the ISTE NETS-S Standards to identify the ICT and 21st century skills, knowledge, and expertise students should master.

Technology Education Curriculum

The District has in place a comprehensive Technology Education Curriculum for all Grades K-12. Within each of the NETS-S Standards, Grade-appropriate objectives and assessments have been created for Grade levels K-2, 3-5, 6-8, and 9-12. This curriculum guide provides the framework for the instruction of technology literacy skills that is consistent across Grade levels. These technology literacy skills prepare students with the expertise needed to integrate technology in their core subject areas.

Student Digital Portfolios

The purpose of the student digital portfolio is to develop a collection of student-created digital artifacts that demonstrate knowledge, skill, and understanding of the ICT literacy standards as they are integrated into the core subject areas of the curriculum. Through a chronological digital collection of their work, students demonstrate growth and competency in the use of technology tools and resources within those core subject areas.

The District utilizes Mahara as the application used by students to store their digital artifacts. Mahara integrates with our Moodle Classroom Management System.

Distance Learning

Current Usage of Distance Learning Sessions and Collaborations:

- Currently we are connecting our classrooms to various educational institutes across the country, Zoo's, Authors and Museums for programs that complement our state standards and curriculum for students.
- Our Elementary, Middle School and High School classes have participated in collaborations. It is a learning experience for the students and teacher as they find the links between the two curriculums and begin to interact as one large group.
- Peer connections- Both Middle and High School students have been connecting with the Elementary Schools to teach internet safety and model positive behavior. This is done through projects, readings and discussions.
- We have been communicating with State Parks and other individuals that don't have traditional Distance Learning equipment using Skype to set up share sessions.
- Connect students with experts in their fields. This helps students gain knowledge of the classes needed to obtain the career.

Future Plans for Distance Learning Collaborations:

- Offer more afterschool interest or enrichment connections to students.
- Investigate the option of offering classes to students that would count towards High School and/or college credit. Ex. Chinese.
- Increase the number of collaborating classrooms.
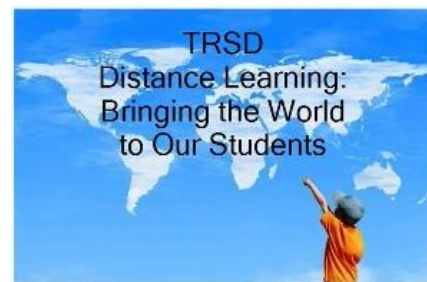
Specialized Courses

The High School utilizes specialized courses to assist students meet their educational goals. NovaNet Credit Recovery is an online curriculum that we use to recover failed academic quarters for students. Students "redo" important modules of curriculum content to reach curriculum competency. This program is also utilized to assist in skill building for students deficient in certain curricula areas. Additionally, the NovaNet program is used in our summer school program. Students also take online courses, mostly at VLACS, for credit accrual in areas that they would like enrichment, enhancement of their academic schedule load, or to assist in scheduling all their courses of interest here at the high school.

Technology Integration Strategies

The District has explored and reviewed a number of new emerging technology resources, as well as other technology deployment initiatives such as 1:1 computing programs, BYOD, and cloud computing.

Mobile Computing/BYOD

Trends:

- Mobile devices are saturating the market, especially as the technology is becoming more affordable.
- Districts face ever tightening budgets.
- Publishing companies are making more of their curriculum and resources available digitally.
- Companies are making more and more educational apps available for educators and students.
- BYOD districts are moving more toward internet-based (often free) software to address equity concerns. Moodle and Google Apps for Education are examples.
- The online Learning Platform, itslearning, was introduced in the US in 2010 and has quickly become an option for BYOD districts. It works on any device and operating system.
- Not 1:1 or BYOD, but both. Many districts are willing to provide an adequate, entry-level device at no cost to the student. However, students are able to bring in their own device they prefer at their own cost.

Quotes:

"Schools are beginning to allow students to use their own technology devices for classroom learning as the benefits of cost savings and student engagement start to outweigh the fears of distraction and inequity." (Electronic Education Report 2010)

"Though data in pockets across the country show clear evidence of the positive impact of every student have a computing device, and although there remain challenges to the arrival of ubiquitous one-to-one environments, the trend overall is still in one direction. At this point, what district would want to go backwards?" (District Administration, June 2011)

"It takes both teacher support and pushing by the principal to change how the technology is being used." (District Administration, June 2011)

"There has to be a willingness to systemically re-envision the learning culture." Not to use technology as "nothing more than a glorified pencil" or "word-processing tool." (District Administration, June 2011)

"Kids ask serious questions and use the laptops to build learning artifacts – such as films, podcasts, blog entries, and oral history interviews – that show the answers." (District Administration, June 2011)

Considerations:

Wherever possible, former textbook funds should be redirected to cover the cost of curriculum apps and/or online software subscriptions.

Technology resources must be made available to ALL students. In order to maintain equity, any BYOD plan that is implemented should not be considered as a resource requirement to complete assigned classroom projects.

Existing Acceptable Use Policies should be reviewed to see if any modifications need to be made to accommodate and provide guidelines for the use of mobile devices, including those provided by the District, and personal devices.

Sufficient professional development should be provided to teachers so that they are familiar with the capabilities and operation of the mobile devices, and for developing effective classroom integration strategies.

Pilots and Initiatives:

The District has piloted in the 2011-12 School Year, a 1:1 eReader implementation for a High School AP History class. They are being used to replace outdated textbooks.

In the 2012-13 School Year, the District will add an additional set of eReaders to support two World Studies classes.

In the 2012-13 School Year, the District will deploy 30 iPads and associated carts for use at the Middle School for 6th Grade Social Studies and 8th Grade Math Literacy.

In the 2012-13 School Year, the District will deploy 10 iPads for use by Elementary School teachers to explore their capabilities as a mobile "interactive whiteboard" and presentation tool. Included will be the eInstruction Insight 360 formative instruction software, iPad app, and iPad Case.

Web 2.0 Collaboration

Web 2.0 resources have evolved to the level of being able to accommodate online, real-time collaboration. Applications such as Google Docs enable multiple people to create and edit documents simultaneously from any location with Internet access. In another example, we have experimented with MindMeister, which is a mind mapping online application that also supports real-time collaboration.

The District uses emerging Web 2.0 technologies to create, contribute, and collaborate within and outside of our district. Collaborative tools are used to enhance classroom instruction: blogs, wikis, social networks, social bookmarking, podcasts, file, photo, presentation, and video sharing, virtual and augmented worlds. These online tools provide unique ways to teach and engage students. We also meet the needs of the ICT competencies teaching digital media safety, citizenship, and literacy using Web 2.0 tools.

Project-Based Learning

Project-based learning focuses on students doing "work that matters". It is a way for students to learn by engaging in real-life activities and by solving real-life problems. It also promotes group collaboration, which is an important 21st century skill.


The District Technology Department has worked together with school staff to establish project-based learning classroom activities that are supported by the use of technology resources. In the 2010-11 School Year, a Middle School 6th Grade Science class studied the NASA/JPL Mars Science Laboratory mission as part of their Space Science work.

The students emulated JPL scientists and technicians by building "rovers" using Lego Mindstorms NXT robotic kits. The students also created programs that instructed the rovers to perform specific maneuvers. The robotics project is now an ongoing part of the 6th Grade Science Literacy curriculum.

In the 2011-12 School Year, a 4th Grade class used Google SketchUp as part of their study of geometric shapes and volumes. By applying various basic shapes in Google SketchUp, students created 3D floor plan layouts of their own design. During the course of this project, the students had become true Architectural Designers! This project was a joint effort by the School's Technology Teacher, and the 4th Grade Classroom Teacher.
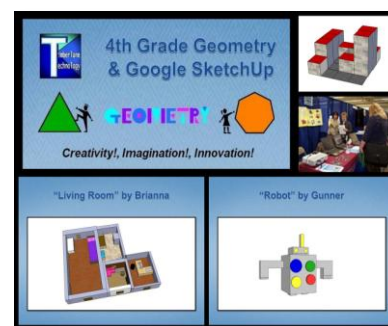

Using their 3D printer, the Engineering Teacher at the High School participated in this project by "printing" a 3D robot from a student SketchUp design. The 4th Grade class also had a field trip to the High School to see the 3D print in action.

Immersive Technologies

Augmented Reality (AR) and Virtual Reality (VR) technology, applied to educational purposes, offers the potential to enhance student engagement in classroom projects and activities. The District is involved with a number of AR and VR pilot projects. They are:

Letters Alive! – This is an Early Elementary Reading skills development application that applies AR technology to overlay traditional flash cards with animated 3D objects (animals). The visual and audio effects add an exciting, interactive element to enhance student attention and comprehension. The District introduced Letters Alive! in the Pre-School program in the 2011-12 School Year.

BuildAR – This is an AR Presenter application that enables us to create and display our own 3D "scenes". 3D objects from applications such as Google SketchUp can be imported into the program and associated with a unique "pattern" image. When the pattern is placed in the view of a web camera or document camera, the 3D image is superimposed on the screen display. The District is experimenting with a free version of BuildAR to explore innovative ways to present student-generated 3D models.
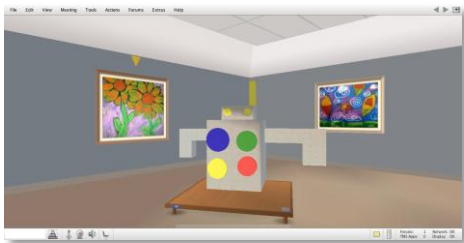
OpenQwaq – This is a VR application that enables us to create customized, secure, virtual "forums". Navigation in the virtual "forums" is done through the use of an avatar. The District is experimenting with this application as a potential resource to showcase student-generated artifacts and project designs. Artifacts can be artwork, 3D objects, slideshows, links to student created videos, etc. At the 2011 Christa McAuliffe Technology Conference, we used OpenQwaq as a virtual "showroom" to display selected 3D objects created by 4th Grade students. We are also exploring using OpenQwaq to create a virtual "museum" to exhibit Middle Student work that relate to "Science in Ancient Greece", as a Social Studies and Science collaboration project. OpenQwaq is a free, open source application.

Avaya web.alive – This is an actual business-class application that utilizes state-of-the-art VR technology for accommodating online meetings, collaborations, and eLearning. The District has obtained a basic subscription that provides a secure, dedicated virtual office conference area for collaboration projects. The application includes a number of presentation tools typically used in group meetings. Starting in the 2012-13 School Year, The High School Business Department plans to use this resource in their Business Classes. The goal is to eventually expand the use of this resource to include Business Class collaborations with other School Districts.

We are starting to see specific core subject area curriculum applications becoming available that utilize VR technology to provide engaging supplementary skills instruction. An example is Pearson's DimensionM. DimensionM is an immersive 3D application that engages Elementary and Middle School students in learning and applying mathematics. EcoMUVE is a current research project at Harvard Graduate School of Education that uses immersive virtual environments to teach Middle School students about ecosystems.

Cloud Computing

Cloud Computing, also referred to as Software as a Service (SaaS), has become a more viable alternative way to perform computer tasks that traditionally required a locally installed application. Along with the application, your files are also usually stored "in the cloud". The District currently has a Google Apps for Education domain that provides a number of cloud computing applications such as Gmail and Google Docs.

To help support the new High School Freshmen Academy initiative that will begin in the 2012-13 School Year, we plan to establish Google Apps accounts for all freshmen students. This will provide students anywhere, 24/7 access to their school work, as well as to teacher provided class content. This initial Google Apps implementation will provide us with benchmarks and results data to help pave the way for expanded Google Apps deployment to additional grade levels.

Subject Area Focus

At Timberlane, we have adopted and follow the concept of "Purposeful use of Technology". Technology resources we deploy must address how they will support and enhance learning in the specific core subject areas.

The High School Departments have prepared 3-Year plans that include strategies for updating courses to include 21st century skills, and their vision for the integration of technology. The Middle School has established curriculum visions and goals for all of their core subject areas. The Elementary Schools focus is on providing students with a solid foundation of literacy skills to help them *read to learn* across the entire curriculum.

Arts & Humanities

In the 2012-13 School Year, three High School World Languages classrooms will be equipped with a learning lab cluster station that will include five computers, associated A/V accessories, and audio and video capture and editing capability.

The High School Art Department would like to extend their course offerings to include computerized animation and digital art. Technology resources to support this initiative will be evaluated and applied as needed.

The High School English Department plans to continue updating their curriculum to include new forms of literature, and to embrace useful technology in the written world. In the 2012-13 School Year, eReaders will be provided to students to support World Studies classes. The Department is also increasing its use of technology resources for film making and editing.

Also in the 2012-13 School Year, the Technology Department will be providing access to the Adobe Creative Suite software school-wide, at both the High School and Middle School.

In the 2012-13 School Year, the Middle School will be piloting an iPad 1:1 initiative to support their 6th Grade Social Studies curriculum.

Business & Office Technology

The High School Business Department is establishing new course offerings which reflect current employable skills. Technology plays a big role in business data collection, communication and collaboration, and project presentations. We will continue to provide technology resources and support, such as Web 2.0 collaboration tools, that will enhance student engagement and provide opportunities for real-life and community engagement project activities.

STEM

The High School Math Department would like to investigate the use of new calculators that can be used to collect experimental data, and provide real-time student assessment information to teachers. We will also be researching and reviewing iPad applications for potential deployment to support Math learning.

In the 2011-12 School Year, a Computer Technology Teacher at the High School experimented with Greenfoot as a supplementary instructional resource for her Java Programming class. Greenfoot is a free software application that uses object oriented programming, along with textual Java code, to create games, simulations, and other graphical programs. The students are using Greenfoot to control a Finch, which is a robot that is programmable using Java. The Finch has a number of sensors, including light, temperature, and IR.
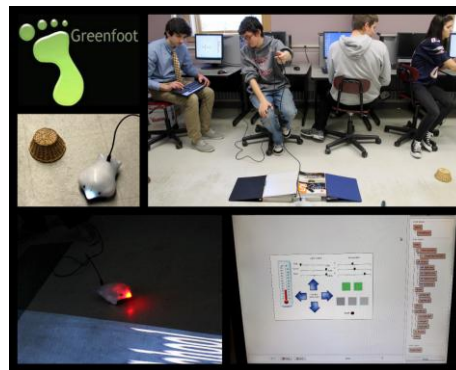
The High School Science Department has a solid vision and eagerness for using technology for data gathering, simulation, data analysis, and presentation. We are continuing to work towards improving the connectivity capacity in the Science classrooms to support the data intensive resources they use, such as digital microscopes and high resolution image capture and editing.

In Middle School Mathematics, emphasis is placed on application through the use of problem solving, reasoning, communication, and making connections in order to build mathematical understanding. In the 2012-13 School Year, Middle School 8th Grade Math Literacy will be part of an iPad 1:1 initiative.

In the 2011-12 School Year, a 5th Grade class at Danville Elementary integrated Lego Mindstorms NXT robotics into their Space Science curriculum. Students are working in teams programming the robots to travel a fixed length distance, and navigate various turns. Students are learning critical math skills as they calculate number of wheel rotations needed to travel a specific distance. Using distance learning, the 5th Grade students had the opportunity to ask questions from current 7th Grade Middle School students who participated in a robotics project during the 2010-11 School Year.

Technology Supported Collaborative Learning

In the 2011-12 School Year, the District was able to establish a partnership with the Engineering Department at Norwood High School, located in Norwood, MA, to provide students with on-going learning opportunities and experiences that extend beyond the classroom walls. Working closely with the Engineering Teacher at Norwood High School, we are together exploring and implementing projects that use technology to facilitate collaborative learning and resource sharing.

In one of the projects, Norwood High School Engineering students are mentoring our 5th Grade students at Danville Elementary who are doing robotics lessons. Using Skype, The Norwood students are providing real-time instruction on how to program and use the various sensors on the Lego Mindstorms NXT robots. In addition, the Norwood students have created instructional and demonstration videos that are delivered to our students using Skype file transfer.

In another project, we are experimenting with using technology to enable the ability for real-time, remote control of robotic devices. Using remote desktop software, a web cam, and Vex robotics, the remote operator is able to control and view the robotic device over the Internet. The possibilities of this initiative are to enable schools that do not have the engineering resources, the opportunity to provide their students with the ability to develop and test programs. Also, to provide Elementary School students with the ability to conduct educational experiments remotely.
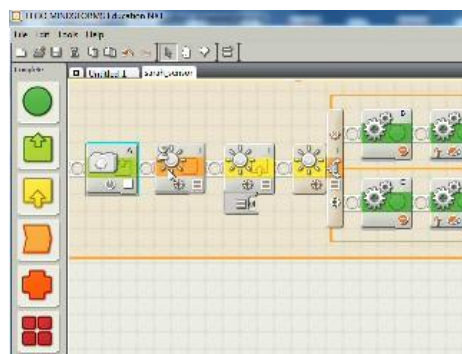
Lego Mindstorms NXT-G Dashboard

Professional Development

Our goal for technology professional development is to provide flexible and on-going training opportunities to staff in the following areas:

- Staff ICT literacy proficiency, as outlined by the ISTE NETS-A and NETS-T standards.
- Skills for integrating technology into the instruction of core subject area content.
- Skills for integrating technology to foster 21st century skills for students.

This goal correlates with the District's Strategic Plan Goal #4, strategy 4.2, to "provide teachers personalized, sufficient, ongoing instruction, and time, to incorporate technology "best practices" into classroom subjects and support student efforts using technology." (TRSD Strategic Plan, April 2009)

As do students, teachers adapt to specific training models that best support their learning style. To that end, technology professional development efforts will include the following activities:

- New teacher orientation at the District's Induction with Mentoring summer program.
- In-district workshops offered during professional development days, early release days, and some after school sessions.
- Out-of-District workshops hosted by various local professional development centers.
- Vendor training to support the implementation of specific curriculum technology tools and applications.
- Opportunities to attend the annual Christa McAuliffe Technology Conference.
- Assistance with establishing personalized Professional Development Networks.

In the 2011-12 School Year, the District established a Technology Discovery Center (TDC) resource room at the High School to provide teachers a facility to go to at any time of the school day to explore new technology tools and applications, and/or hone their ICT literacy skills. The room is equipped with eight laptop computers, and various other technology tools, including a Mobi interactive whiteboard tablet, document camera, scanner, and supported software applications. Teachers may visit the room on their own, with a peer, or schedule a time with a Technology staff person for individual instruction assistance.

The District utilizes training resources offered by the following institutions and affiliations:

- New Hampshire Department of Education (NHDOE)
- Southeast Regional Education Service Center (SERESC)
- Southeast Professional Development Center (SPDC)
- New Hampshire Society for Technology in Education (NHSTE)

In a recent survey, teachers were asked "Which professional development experiences or resources would be most effective in helping you better use digital content in your classroom"? (Speak Up 2011 Teacher Survey, December 2011). The chart below shows the top three responses from a group of 81 TRSD teachers:
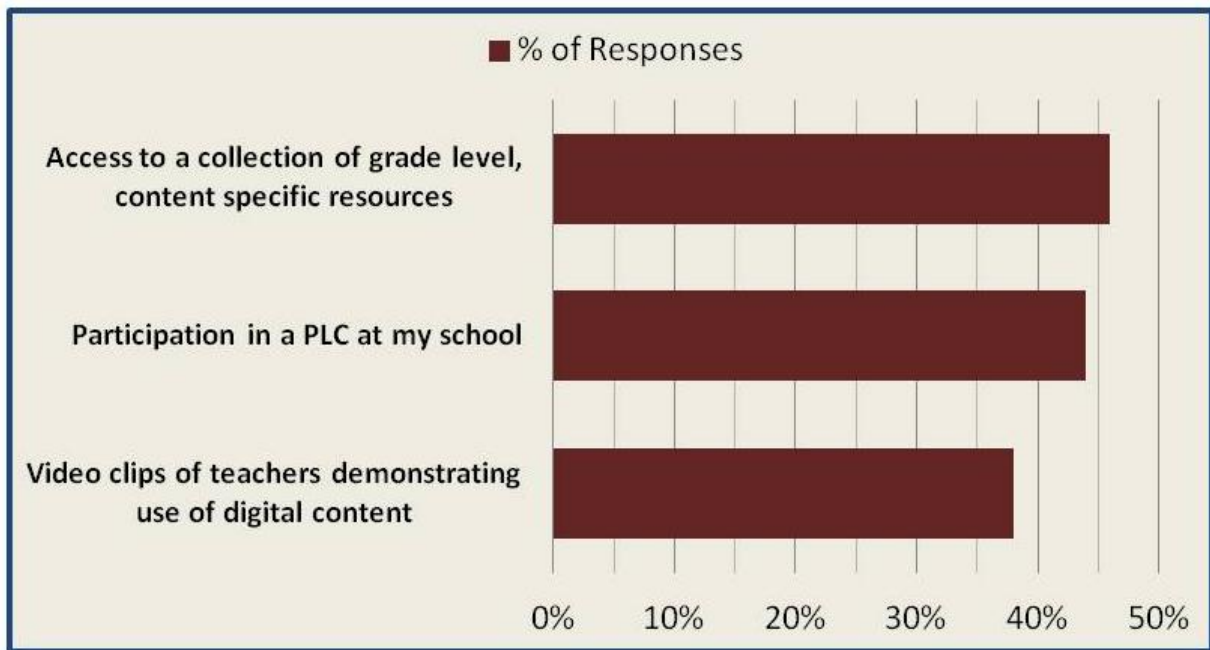
The TRSD Technology Department recently established a New Hampshire Educators Forum group on the Curriki website. This forum is intended to be a growing collection of "best practice" lesson plans and instructional activities contributed by New Hampshire Educators. The focus of the material is to demonstrate the effective use of technology integration to support a 21st century learning environment, with attention placed on alignment with Common Core Standards. The web address for the forum group is: http://nheon.groups.curriki.org.

Also in the 2011-12 School Year, we established a new channel on the Vimeo website to function as a collection of videos that demonstrate 21st century classroom activities. This initiative was a Timberlane Regional and Hampstead School District collaborative effort. Both districts can submit videos for publication and sharing. We have provided workshops to help teachers create and edit their videos. The web address is: https://vimeo.com/channels/21cvideos.
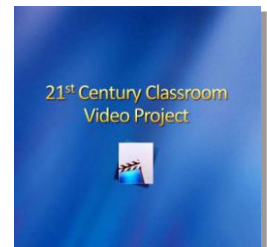
Community Collaboration

The Timberlane Regional School District promotes the use of technology to increase communication between the school system and the local and global community. Technology provides a path for parental and community member involvement in the education process and encourages student engagement beyond the academic setting. Ideally, its use assists in developing positive interactions that improve both the educational system and the community it serves. To further this mission, the following action statements should inform our decisions and our aspirations:

- Increase community and business partnerships that enhance the academic, social, and civic mission of our schools.
- Increase the opportunities for student projects to add value back into the community.
- Increase the opportunity for staff, students, and community members to learn new technological skills, and use technology to advance skills in other disciplines.

Outreach and Information Resources

- The TRHS Adult Education and Evening Division provides credit courses leading to a diploma for traditional and non-traditional students, and other continuing education and enrichment classes to meet community needs.
- TRSD Media Centers have numerous resources that can be accessed by students and the community in a variety of ways. The students can search holdings through Destiny, a district-wide resource which provides a dynamic portal to the card catalog system, all on-line databases, and e-books. There are many technical resources available through the Media Centers (DVR recordings, e-book uploads to iPods, etc).
- TRSD websites and email listservs are a primary method of communication with parents, students, and the community. Starting in the 2011-12 School Year, school websites are being transitioned to the WordPress web publishing platform.
- The Timberlane Educational Network (TEN) is our cable TV channel (6 and 22) used to broadcast official School District meetings, student productions, school events, and various informational notices.

Budgeting

Projected Costs & Timeline

Category	2012-13	2013-14	2014-15
Technology Dept. Staff	$510,918	$531,355	$562,609
Hardware & Networking	$394,125	$420,000	$420,000
Software	$98,835	$85,000	$85,000
Professional Development	$7,500	$12,000	$12,000
Contracted Services	$30,000	$23,000	$23,000
Hardware Repairs	$8,000	$9,000	$10,000
Supplies & Misc.	$90,320	$30,000	$30,600
Total	$1,139,698	$1,110,355	$1,143,209

Budget Narrative

The Technology Dept. Staff amounts are based on a projected 4% annual increase. The 2014-15 amount also includes an additional amount to establish a Technology Integration Specialist position for the Elementary level.

The Hardware & Networking amounts are projected costs for computer replacement, and for planned 1:1 initiatives. Also included are replacement videoconference codec in 2012-13, equipment for the new video editing room at the Middle School in 2012-13, and computers for the World Language Department at the High School in 2012-13. Projected new equipment for 2013-14 and 2014-15 includes 120 eReaders for tier 2 Literacy in Grades 6-8, and iPads for Grade 6 Humanities integration.

The projected decrease in Software is based on our growing use of free open source software and cloud computing. The amounts include annual subscriptions to Discovery Education Streaming and Learn360.

Professional Development has been increased in order to provide additional technology workshop offerings and increasing participation in technology conferences.

Our in-house staff expertise has enabled a projected reduction in Contracted Services.

Repair costs are projected to increase each year as a result of the expanding number of mobile devices (iPads, iPod Touch, etc.) being deployed.

The decrease in Supplies & Misc. is due to the redirection to the schools' supply accounts, funds to cover printer toner costs in their buildings.

Other Funding Sources

In 2009-10, TRSD was one of about 22 school districts to receive funding from the Title II-D ARRA 21st Century Classroom Grant. This grant provided approximately $130,000 that was used to fund a 1:1 netbook initiative to support Math and Science learning. The District has also received funding from participation in a number of recent Mini Grants and TLC Grants. Although the future of Title II-D funding is currently unknown, the District will continue to actively pursue all other applicable grant opportunities that may become available.

The District annually applies for and receives E-Rate discounts that offset much of our telecommunication costs. Our current discount rate is 40%. There are many organizations, such as NASA, The Center for Civic Education, etc.; who provide Outreach Programs to educators and students that includes free online resources, lesson plans, and other educational services. The utilization of these resources that directly support the District's curriculum is an effective way to supplement district funded resources.

Evaluation

Evaluation of the effectiveness of our technology integration, staff professional development, and student ICT and 21st century skills achievement, must take on many forms. One of these is direct feedback from staff. All of our technology workshops require participants to evaluate the session and indicate the level of value and benefit they received from attending the session.

In the 2011-12 School Year, students from the High School were invited to attend one of the District Technology Committee meetings, for the purpose of providing a student perspective on our use of technology, and to provide their ideas and recommendations on how we can do better. Beginning in the 2012-13 School Year, our plan is to establish a permanent student presence on the District Technology Committee as regular active members.

The District has implemented TechSteps in all Elementary Schools to assess student ICT literacy and 21st century skills, and is currently reviewing EasyTech as a possible replacement. At the Middle School level, student portfolios are used for ICT literacy assessment, using the state-wide common rubrics. High School students have the ability to add artifacts to their existing portfolios to further demonstrate ICT literacy at the High School level. The High School offers a number of technology courses for students to take to obtain their required ½ ICT credit. Currently, the High School does not use student portfolio assessment as an alternate method to award ½ ICT credit.

The District has adopted the framework established by the Partnership for 21st Century Skills as a reference resource for the development of our vision of learning to ensure 21st century readiness for our students. This includes discovering ways to integrate 21st century skills development into the core subject areas, and creating effective 21st century support systems (Learning Environments, Professional Development, Curriculum and Instruction, Standards and Assessments).

One of the functions of the District Technology Committee is to continually review ongoing technology project initiatives to determine how well they are on track, and to analyze benchmark measurements. If necessary, revisions are made accordingly to respond to changes and/or new opportunities.

Policy and Procedure

Internet Access/Safety

High-speed broadband cable Internet is being provided to our schools and district office by Comcast in Plaistow, Sandown, Atkinson and Danville. Our T1 lines can be used as a backup internet connection. SonicWALL PRO Internet Security Appliances are being used in all of the schools in the district. This equipment provides the schools with the following Internet security protection:

Firewall Security & Content Filtering

SonicWALL PRO provides an ICSA certified firewall that uses packet inspection to help protect the school's LAN from Internet hacking. SonicWALL also provides controlled/authenticated access to the internet and logging through their Viewpoint software.

SonicWALL's Internet Content Filtering provides a network administration tool that monitors Internet activity on the LAN and blocks attempts to access sites listed on the SonicWALL's CFS service. SonicWALL's CFS service is a dynamic list of sites containing inappropriate material. The list is maintained by SonicWALL and is updated automatically via subscription. SonicWALL is the most widely used Internet Content filtering application in use in the State (according to the NH School Tech Survey Data Summary 2006-07). With these resources in place, the district meets the compliance requirements as set forth in the Children's Internet Protection Act (CIPA).

Technology Policies

The Timberlane Regional School Board has adopted various technology related policies:

- School District Internet Access for Students (EGA)
- Acceptable Use Procedures (EGA-R)
- Computer Security, Email, and Internet Communication (EHAA)
- Website Publishing Policy (KDC)
- Online/Virtual Education (IMBA)

Technology Education Curriculum Maps

Strand	Standard
Creativity and Innovation	Students demonstrate creative thinking, construct knowledge, and develop innovative products and processes using technology.
Grades	**Objectives**
K-2	• Illustrate and communicate original ideas and stories using digital tools and media-rich resources. • Identify and collect data using digital resources and use that data to forecast possibilities. • In a collaborative work group, use a variety of technologies to produce a digital presentation or product in a curriculum area. • Use simulations and graphical organizers to explore and depict patterns.
3-5	• Produce a media-rich digital story about a significant personal event. • Use digital-imaging technology to modify or create works of art for use in a digital presentation. • Describe a content-related concept or process using a model or graphic organizer • Use digital tools to collect and organize data and make predictions based on that data.
6-8	• Describe and illustrate a content-related concept or process using a model, simulation, or concept-mapping software. • Gather data, examine patterns, and apply information for decision making using digital tools and resources. • Integrate a variety of file types to create and illustrate a document or presentation.
9-12	• Design, develop, test or use digital models, simulations or learning games to demonstrate knowledge, think critically, and develop skills related to curriculum content. • Design web-based accessible communications or presentations that inform others as well as a means of personal or group expression. • Collect data on an issue using digital tools then use that data to make informed decisions.

Strand	Standard
Communication and Collaboration	Students 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.
Grades	**Objectives**
K-2	• Illustrate and communicate original ideas and stories using digital tools and media-rich resources. • Engage in learning activities with learners from multiple cultures through electronic means. • In a collaborative work group, use a variety of technologies to produce a digital presentation or product in a curriculum area.

3-5	• Create a digital presentation to communicate information about content-related concepts. • Communicate with learners in other cultures using digital tools. • Interact with peers within an open source environment created by the class.
6-8	• Use collaborative electronic authoring tools to explore common curriculum content from multicultural perspectives with other learners. • Create original animations or videos documenting school, community, or local events • Participate in a cooperative learning project in an online learning community.
9-12	• Use a variety of online resources to communicate and work collaboratively with peers, teachers, and other professionals in the accomplishment of a project or publication. • Use digital resources and design communications to reach and interact with multiple audiences and cultures.

Strand	Standard
Research and Information Fluency	Students apply digital tools to gather, evaluate, and use information.
Grades	**Objectives**
K-2	• Identify, research, and collect data on an issue using digital resources and propose a developmentally appropriate solution. • Find and evaluate information related to a current or historical person or event using digital resources.
3-5	• Select and apply digital tools to collect, organize, and analyze data to evaluate theories or test hypotheses. • Produce a media-rich presentation about an event or person, using a variety of sources and media. • Recognize bias in digital resources while researching an issue with guidance from the teacher.
6-8	• Evaluate digital resources to determine the credibility of the author and publisher and the timeless and accuracy of the content. • Select and use the appropriate tools and digital resources to accomplish variety of tasks and to solve problems. • Use collaborative electronic authoring tools to explore common curriculum content. • Employ data-collection technology such as probes, handheld devices, and geographic mapping systems to gather, view, analyze, and report results for content-related problems.
9-12	• Select digital tools or resources to use for simulated or real-world tasks and justify the selection based on their efficiency and effectiveness. • Find and evaluate data and information effectively as they approach complex issues associated with their studies.

	• Model legal and ethical behaviors when using information and technology by properly selecting, acquiring, and citing resources. • Identify a problem, develop a plan of investigation, then after processing data, and report the results and possible solutions to the problem.

Strand	Standard
Critical Thinking, Problem Solving, and Decision Making	Students use critical thinking skills to plan and conduct research, manage projects, solve problems, and make informed decisions using appropriate digital tools and resources.
Grades	**Objectives**
K-2	• Identify, research, and collect data on an environmental issue using digital resources and propose a developmentally appropriate solution. • Use graphical organizers to plan and manage a project. • Use digital tools to research other perspectives of how to solve a problem.
3-5	• Conceptualize, guide, and manage individual or group learning projects using digital planning tools with teacher support. • Gather information from multiple digital sources on current events in order to explore alternative solutions to problems. • Select and apply digital tools to collect, organize, and analyze data to evaluate theories or test hypotheses • Identify and investigate an issue and generate possible solutions using digital tools and resources.
6-8	• Select and use the appropriate tools and digital resources to accomplish a variety of tasks and to solve problems. • Gather data, examine patterns, and apply information for decision making using digital tools and resources. • Employ data-collection technology such as probes, handheld devices, and geographic mapping systems to gather, view, analyze, and report results for content-related problems. • Use collaborative electronic authoring tools to explore common problems with other learners. • Develop and apply strategies for identifying and solving routine hardware and software problems.
9-12	• Analyze the capabilities and limitations of current and emerging technology resources and assess their potential to address personal, academic, social, lifelong learning, and career needs by interacting with others using electronic means. • Identify complex issues and use technology with a systematic plan of investigation and communicate/present innovative sustainable solutions based on data collected. • As needed troubleshoot hardware, software, and network systems to expedite and optimize their use for learning and productivity.

Strand	Standard
Digital Citizenship	Students understand human, cultural, and societal issues related to technology and practice legal and ethical behavior.
Grades	Objectives
K-2	• Understand what it means to be a digital citizen. • Demonstrate the safe and cooperative use of technology as a digital citizen by working in group situations to produce a digital product. • Use digital technology to produce a product that shows responsible use of information.
3-5	• Debate, with their peers, the ability of existing and emerging digital technologies to promote collaboration, learning and productivity within the global community. • Reflect on how digital technology has enhanced their learning in a positive way. • Practice safe, responsible use of digital technology and information including digital rights and responsibilities, etiquette, and safety.
6-8	• Use electronic authoring tools to debate, with their peers, the ability of existing and emerging digital technologies to promote collaboration, learning and productivity within the global community. • Model legal and ethical behaviors when using information and technology by properly selecting, acquiring, and citing resources.
9-12	• Analyze the capabilities and limitations of current and emerging technology resources and assess their potential to support collaboration, lifelong learning and productivity. • Model legal and ethical behaviors when using information and technology by properly selecting, acquiring, and citing resources.

Strand	Standard
Technology Operations and Concepts	Students demonstrate a sound understanding of technology concepts, systems, and operations.
Grades	Objectives
K-2	• Demonstrate the ability to navigate and troubleshoot using technology such as electronic books, simulation software, and software applications. • Establish a set of rules to use when interacting with learners from multiple cultures through electronic means. • Determine how parts of a computer contribute to the computer system. • Decide which technology application to use in order to produce a digital product for a curriculum project.
3-5	• Apply previous knowledge of digital technology operations to troubleshoot common problems occurring with hardware and software. • Modify or create works of art using a new application that is similar to ones used previously. • Select appropriate digital tools to collect, organize, and analyze data. • Explain how to use digital instruments and measurement devices to collect data.

6-8	• Integrate a variety of file types to create and illustrate a document or presentation. • Select and use the appropriate tools, and digital resources to accomplish a variety of tasks and to solve problems. • Develop and apply strategies for identifying and solving routine hardware and software problems.
9-12	• Select digital tools or resources to use for a real-world task and justify the selection based on their efficiency and effectiveness. • Analyze the capabilities and limitations of current and emerging technology resources and assess their potential to address personal, social, lifelong learning, and career needs. • Configure and troubleshoot hardware, software, and network systems to optimize their use for learning and productivity. • Learn how to use a new application program independently using current knowledge of how applications work.

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