Scarsdale Technology Plan

2016-2019

Scarsdale Public Schools
Scarsdale, NY

The Scarsdale Mission Statement

The Scarsdale Public Schools seek to sponsor each student's full development, enabling our youth to be effective and independent contributors in a democratic society and an interdependent world. To this end, we endeavor to help them to think and express themselves clearly, critically and creatively; to understand themselves and others within the broad fabric of human experience and the natural universe; to appreciate their rights and responsibilities as citizens; and to become people of integrity, maturity and generous spirit. A measure of our success is the degree to which they fulfill their potential for the common good, *non sibi* -- not for themselves alone. Valuing our individuality, we unite to keep the flame of learning.

The Scarsdale Technology Vision Statement

The Scarsdale School District has a longstanding, continuous commitment to providing our students with an outstanding education. To that end, we seek to achieve and maintain best practices in using technology to support the educational experiences of all students. The use of technology should be seamlessly integrated into the curriculum and teaching.

We believe that all members of the school community should be able to:

- Use appropriate technology as a tool for teaching, learning, and assessment
- Have access to appropriate desktop and mobile technology throughout the District, including classrooms, labs, libraries, and offices
- Use technology to empower learners by giving them tools for designing, communicating, and collaborating
- Use technology to allow all users to curate information and solve problems
- Recognize the ethical and legal responsibilities and opportunities of learning and working in an increasingly interconnected community

In order to realize this vision, we must continually respond to changes in technology by maintaining a robust technology infrastructure, providing technical and financial support, and investing in professional development for all staff, and providing a wide variety of educational opportunities for all students.

Introduction

The expanded use of technology in all grade levels and departments has made the instructional and administrative use of computers an important and highly visible District initiative. Technology is an integral part of District operations, and is the teaching, learning, and increasingly, the assessment platform for our students.

Effective use of technology requires careful planning. During the 2015-2016 school year, the K-12 Technology Committee dedicated three meetings to discussing goals for District technology use, and planning a process for revising the District Technology Plan. In addition, many subcommittee meetings were dedicated to writing specific portions of the technology plan, including meetings dedicated to STEAM and Digital Literacies, and Coding.

This Technology Plan focuses on two areas: Instructional Technology and Information Technology. The first section of the plan describes computer expectations for students at all levels. The second part of the plan describes goals for the administrative use of technology, as well as the hardware, software and infrastructure that support all of the District's technology initiatives.

The plan also is supported by three integrated components - a K-12 STEAM Sequence, a K-12 Coding Sequence, and a K-5 Digital Literacies Framework. These integrated components will be finalized this year.

This plan makes many recommendations about future directions for technology in the District that will enable Scarsdale to provide all members of its learning community with access to appropriate technological resources, enhanced instructional programs, and opportunities for professional growth. We would like to thank the members of the K-12 Technology Committee for their work in developing this plan. We would also like to thank Victoria Presser for editing this document. Finally, we would like to thank the members of the administration, teaching staff, the Board of Education, and the community for their continued support of our District technology program.

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The Scarsdale Technology Plan: Setting the Context

National Technology Planning Efforts

Several national technology planning initiatives, sponsored by major educational technology leadership organizations and the U.S. Department of Education, have provided a framework for the District Technology Plan.

The latest National Technology Plan, *Future Ready Learning: Reimagining the Role of Technology in Education* (http://tech.ed.gov/netp/) was released in 2016. This plan builds on the work of previous technology plans and focuses on equity and accessibility, the "digital use divide," and non-cognitive competencies.

The International Society for Technology and Education (ISTE) is the leading professional organization for computer teachers and educational technology leaders. ISTE has published technology standards that describe technology competencies for students, teachers, and administrators. These standards specifically address *"What students should know and be able to do to learn effectively and live productively in an increasingly digital world."* The latest standards shift the focus from technology skills to the changing roles of students as they increasingly use technology in their daily lives. These roles include:

- **Empowered Learner:** Students leverage technology to take an active role in choosing, achieving, and demonstrating competency in their learning goals
- **Digital Citizen:** Students recognize the rights, responsibilities, and opportunities of living, learning and working in an interconnected digital world, and they act in ways that are safe, legal, ethical, and self-aware.
- **Knowledge Curato**r Students make meaning for themselves and others by critically curating resources through the use of digital tools.
- **Innovative Designer:** Students use a variety of technologies within a design process to solve problems by creating new, useful, and/or imaginative solutions.
- **Computational Thinker:** Students identify authentic problems, work with data, and employ algorithmic thinking to propose and automate solutions.
- **Creator and Communicator:** Students communicate clearly and express themselves creatively for a variety of purposes using the tools, styles, formats, and digital media appropriate to their goals.
- **Global Collaborator:** Students use digital tools to broaden their perspectives, increase empathy and understanding, and work effectively in teams.

These standards are reflected in the goals presented in this plan.

Technology Planning in New York State

The New York State Technology Plan outlines the components required for state approval of a district technology plan. Plans should include:

- A description of instructional technology devices and how they will support the overall K-12 instructional program
- A provision for the maintenance and repair of equipment
- A provision for staff development. to demonstrate how classroom teachers will use instructional computer technology across the K-12 curriculum

The Planning Process

In the summer of 2015, the Director of Instructional Technology organized a meeting of the computer teachers to discuss the process and timeline for creating a revised technology plan.

The technology plan focuses on two areas, reflecting the reorganization of the technology department:

The Learning Community
This section includes a description of the instructional program and student competencies for elementary, Middle School, and High School students.

Information Technology
The increasing use of technology to manage administrative services provides opportunities to increase efficiency within the District. In addition, this section describes current progress in upgrading Scarsdale's technology infrastructure, as well as plans for future infrastructure projects.

Technology Needs Assessment

Teacher input was an integral part of the planning process. Teachers had opportunities to provide input by serving on Technology Committees, and technology goals were also discussed during department meetings at the Middle School and High School.

The computer teachers met throughout the year to discuss key elements of the plan. During the past year, computer teachers and members of the technical services staff hosted and attended vendor presentations, and also participated in workshops and technology conferences (See Appendix A).

Technology portfolio updates were provided to the Board every month, and a technology budget overview was presented to the Board in February, 2016. New York State requires that

technology plans be renewed every three years and reviewed every six months. The current technology plan was submitted to New York State in the fall of 2015. That plan was approved. This new plan must be submitted to the state portal in the summer of 2016 to replace the current plan.

Instructional Technology

The instructional technology program is based on the constructivist philosophy of education and features environments and software tools that allow students to construct their own knowledge. The instructional technology program is also a key component of "The Scarsdale Education for Tomorrow."

Student Computer Expectations

Student computer expectations are a key component of our instructional technology plan. At the elementary and Middle School level, expectations are based on categories and are correlated to the latest revision of the International Society for Technology Education (ISTE) National Educational Technology Standards. At the High School level, departments support technology expectations that are also based on the latest ISTE standards.

In addition to academic expectations for technology use, all students are expected to follow the guidelines of the current District Internet and Acceptable Use Policy. This policy addresses issues related to social and ethical uses of technology. Specifically, all students are expected to respect the intellectual property rights of others, and use technology in a socially responsible manner.

Computer expectations at the elementary level are met through direct instruction provided by the elementary computer teachers, classroom teachers, and librarians. At the Middle School and High School, expectations have been created by each department to insure that students have technology-related experiences within many areas of the curriculum, taking place in classrooms, labs, and library media centers. Computer teachers at the Middle School and High School also provide direct instruction to students.

The Elementary Schools

The elementary technology program provides an important foundation for Scarsdale students. The program is comprehensive and interdisciplinary, addressing major themes within the curriculum.

Elementary school computer teachers support curriculum development and integration, technology instruction, and professional development in their respective schools. The computer teachers and classroom teachers are assisted by two computer aides who support the instructional program. The Head Elementary Computer Teacher coordinates the instructional program and consults with the other elementary computer teachers on a regular basis.

Elementary students engage in curriculum-related technology activities designed by their classroom teacher, computer teacher, and/or library media specialist. During the primary grades, students become engaged in a number of developmentally appropriate computer projects, beginning in kindergarten. Computers are used for problem-solving activities, creating simple publishing projects, painting and drawing, and slideshow presentations. As students progress through the grades, they complete projects and participate in technology-based activities that are more complex. Fifth grade students participate in an inquiry research experience, the Capstone Project, that brings together many of the strategies and skills they've learned in their elementary years.

Through the incorporation of mobile devices such as iPads and Chromebooks and online tools which include Edmodo, Google Docs, and videoconferencing, students in grade K-5 develop their technology skills and dispositions through collaborative inquiries. The goal is for students to leave the elementary schools with the feeling that they can find, evaluate, and present information, and have the confidence that they can use technology independently.

Elementary students also learn how to create multimedia presentations and how to use the Internet as a tool for research. Students also have access to a variety of subscription-based online reference materials and software to support this goal.

Elementary Student Technology Expectations

1. **Empowered Learner**
   Students leverage technology to take an active role in choosing, achieving, and demonstrating competency in their learning goals.
   - Applications such as Google Apps, Wixie, Blogs, iMovie, Garageband, Keynote
   - Google Apps introduced in grade 3, 1:1 Chromebooks introduced in grade 3
   - Students will:
     - Create multimedia presentations
     - Create digital art and media
     - Publish digital text

2. **Digital Citizen**
   Students recognize the rights, responsibilities and opportunities of living, learning, and working in an interconnected digital world, and they act in ways that are safe, legal, ethical, and self-aware.
   - Applications such as Google Apps, Blogs, Twitter, Edmodo, Campus Press, and other online resources.
   - Grades K-5 will have specific lessons and presentations by computer teachers and librarians. Lessons will include a discussion of cyberbullying.
   - Students will:
     - Understand and follow the District Acceptable Use and Internet Safety Policy
     - Advocate and practice safe, legal, and responsible use of information and technology
     - Exhibit a positive attitude toward using technology that supports collaboration, learning, and productivity
     - Demonstrate personal responsibility for lifelong learning
     - Exhibit leadership for digital citizenship

3. **Knowledge Curator**
   Students make meaning for themselves and others by critically curating resources through the use of digital tools.
   - Applications such as Book Creator, Google Drive and Sites, Blogs, Edmodo, and other online resources.
   - Primary grades: Book Creator, Research in grades 3-5, culminating with the Capstone Project in fifth grade
   - Students will:
     - Store, share, access, and manipulate files in Google Drive
     - Organize and reflect on content in Google Sites and Campus Press Blogs
     - Use apps such as Book Creator in primary grades to explain learning in their own words

○ Students will understand that different media has different purposes.

4. **Innovative Designer**
Students use a variety of technologies within a design process to solve problems by creating new, useful and/or imaginative solutions
- Apply tech and no-tech tools and materials to support understanding of the design process
- Grades K-5, integrated with science STEAM units and makerspace activities
- Students will:
    ○ Use the design process to identify and/or solve problems.
    ○ Utilize physical tools in conjunction with digital tools to plan strategies for managing and designing their projects or products.
    ○ Develop, test, and refine prototypes of innovative designs, concepts, products or solutions.

5. **Computational Thinker**
Students identify authentic problems, work with data and employ algorithmic thinking to propose and automate solutions.
- Applications such as Scratch, Tynker, Kodable, Tickle, Blockly, Code.org
- Grades K-3 Kodable and other block-based coding, moving to Scratch in grades 4-5 (specific sequence to be finalized in summer 2016)
- Students will:
    ○ Understand that coding is an iterative process that requires testing and debugging.
    ○ Identify bugs in code and search for correct solutions.
    ○ Explain what a programmer does.
    ○ Move a "robot" in various directions using basic programming language.
    ○ Explain sequential programming processes.

6. **Creator and Communicator**
Students communicate clearly and express themselves creatively for a variety of purposes using the tools, styles, formats and digital media appropriate to their goals.
- Applications such as Keynote, iMovie, WeVideo, Google Apps, Padlet, Blogs
- Grades K-5, multiple projects, coordinated with ELA projects and culminating with Capstone reports and presentations in fifth grade
- Students will:
    ○ Understand principles of typography, such as style, scale, alignment, and face, to add visual interest.
    ○ Understand that good presentations do not repeat what is being said, but provide complementary information.
    ○ Students will be able to modify the work, or extend the thinking, of others to generate a novel expression
    ○ Students will understand how visuals and audio work together to enhance communication.

        ○   Share stories and research with a public audience using publishing tools to create digital media productions.

7. **Global Collaborator**
   Students use digital tools to broaden their perspectives, increase empathy and understanding and work effectively in teams.
   - Applications such as Edmodo, Blogs, Google Apps, Videoconferences
   - Grades K-5, across the curriculum
   - Students will:
     - Use collaborative tools to communicate and work effectively with classmates and those outside their classroom and publish to an authentic audience
     - Use social media and video chats to connect with educators and field experts around the world.
     - Use digital communication tools to gain access to diverse global perspectives.

The elementary technology team will continue to foster communication and collaboration through the Google Apps accounts that are available for all students in grades 3-5. The major thrust of these Google tools, such as Docs, will be to encourage communication and collaboration between students and teachers and their peers and colleagues via shared documents and presentations. Exchanging insights, perspectives, and information, and building on them to develop individual acumen, are characteristics of today's globalized education.

The 2016-17 school year will continue from where we left off with last year's technology professional development sessions that focused on Google Apps, Google Plus, and Twitter, allowing teachers to connect with colleagues and experts throughout the District and around the world. These connections can help teachers customize their professional growth and acquire new knowledge.

The technology teachers will continue providing lunchtime technology training sessions and after-school technology professional development; this year they encouraged teachers to share their expertise via ST@C workshops, creating professional learning communities.

As we move forward and strive to align the existing elementary curriculum with the demands of Scarsdale Education for Tomorrow, we will need to bolster the capacity for teachers to implement technology resources and skills that not only motivate students to perform their best, but also develop learners who can succeed in tomorrow's classrooms and participate as contributing citizens in the global community.

The Elementary Library Media Centers

The Elementary Library Media Centers provide a K-5 program in which the acquisition of information literacy skills is integrated into the curriculum. Information fluency is the ability to locate, access, evaluate, analyze, and synthesize information from electronic, print, and other media resources. Technology facilitates the research process by providing students with the tools to quickly and efficiently locate and access information. Additionally, technology provides resources for students to access literature in different formats.

The Library Media Specialists of the Scarsdale Schools support the seamless integration of information technology into development of lifelong learning. The program is aligned with the information fluency standards for student learning developed by the American Association of School Libraries (AASL), *Standards for the 21st-Century Learner*.

These standards shape the District library media program and also serve as a resource for the Library Media Specialists to collaborate with teachers and to teach information fluency skills in the context of classroom curriculum. Working together, teachers and library media specialists plan lessons that weave the inquiry process into curriculum content enabling our students to learn and to think both critically and creatively. Information fluency skills are taught in the context of curriculum. Collaboration between the library media specialist and the classroom teacher is essential to create authentic learning experiences for the critical and creative thinking skills that individual student research fosters.

The Elementary Library program is designed to help students develop into efficient and effective users of print and digital information and tools, including the online catalog, databases, ebooks, and use of the Internet. With the integration of Chromebooks in the upper elementary grades, the necessity of teaching digital and media literacy is crucial. Students are instructed in digital and media literacy which include the critical evaluation of sources for reliability, relevance, and currency.

The Library Media Center works with the classroom teacher to establish grade-level appropriate guidelines for citing sources. The Library Media Center also engages students in discussions about why it is important to cite their sources, and the implications of plagiarism.

Students visit the Elementary Library Media Center with classes, individually, and in small groups. The School Media Specialists teach classes and help students to access literature and resources for personal interest.

Elementary students have access to the following resources both at school and at home:

- Trueflix ebooks
- Britannica ImageQuest
- FactCite
- WorldBook Online Encyclopedia
- Grolier Online Encyclopedia
- Kid Search
- Searchasaurus
- PebbleGo
- Tales 2 Go Audiobooks
- BrainPop

Scarsdale Middle School

Scarsdale Middle School's review of student computing began in the Summer of 2014 with a series of steps taken to identify consistent computing experiences and articulate learning outcomes for students throughout the school. This work represents the continued evolution of student computing goals from their historical articulation as a set of experiences identified by departments to the identification of Assured Digital Experiences and a coherent set of learning outcomes articulated by the faculty. After a comprehensive audit of student computer experiences in the Fall of 2014. the faculty identified those experiences seen as "Essential," as well as those which could be "Assured" by department and team.

The formulation of Learning Outcomes for Student Computing at the Middle School has been informed by conversations with computing colleagues at the elementary and high school levels. We have worked to identify goals and articulate sequences that would be introduced in elementary school and develop throughout a student's years in Scarsdale. These district conversations have also provided the basis for the Middle School's increasing emphasis on Computational Thinking and Creative Computing.

The evolution of computing goals for Scarsdale Middle School students has also been informed by current work to articulate goals by the Computer Science Teachers Association - Association of Computing Machinery and the International Society for Technology in Education (ISTE). A major update of the ISTE standards for students, as well as teachers, administrators, technology coaches, and computer science teachers, will be presented at ISTE's annual conference in June

Finally, the articulation of schoolwide goals at the Middle School is being developed alongside work to refine the curriculum for the sixth grade "technology quarterly." We continue to look for the appropriate balance between realizing outcomes and goals through experiences integrated broadly throughout the curriculum, and experiences taking place within defined programs (for example, the sixth grade computer quarterly and Related Arts Technology classes in grades 6-8).

Ongoing review of these goals, as well as support for consistent goal implementation and growth, including professional development for teachers, is being provided by the Middle School's two computer teachers, members of the Computer Committee, and Department Chairs.

Middle School Digital Experiences
Scarsdale Middle School's Technology Learning Outcomes for Students are divided into three types of digital experiences:

- **Learning Outcomes** related directly to students developing as *designers* and *creators (*not *consumers)* of technology. Each of these outcomes relates to a student's mastery of a creative domain. Together, they represent the Middle School's primary goals for student computing.
- **Digital Proficiencies** related to using school hardware, networks, and applications with confidence.
- **Additional Digital Experiences** provided by specific departments.

Student Expectations
The faculty is committed to providing students with, and preparing them for, a broad range of computing experiences and approaches. In addition, Scarsdale Middle School students are provided with instruction in essential digital literacies like digital citizenship and research skills, building on their experiences in the elementary schools.

Each of the following primary learning outcomes represents a commitment to creative computing, to the development of a student's capacity to learn how to apply a set of tools to the construction of meaning, and to finding solutions to authentic problems. For each Learning Outcome, we note where student experience is assured, as well as relevant curriculum examples.

I. **Digital Citizenship** *Students understand human, cultural, and societal issues related to technology and practice legal and ethical behavior. (ISTE)*
    - Applications:seen across all applications
    - Grades 6-8, across the curriculum, instruction provided by House Counselors
    - Students will:
        - a. Advocate and practice safe, legal, and responsible use of information and technology
        - b. Exhibit a positive attitude toward using technology that supports collaboration, learning, and productivity
        - c. Demonstrate personal responsibility for lifelong learning
        - d. Exhibit leadership in digital citizenship

II. **Research Skills** *Students will learn how to use technology to locate, evaluate, and collect information. (Information Literacy Competency Standards for Higher Education, ALA, 2000)*
- Applications: seen across all applications
- Grades 6-8, across the curriculum, instruction provided by library media specialist
- An information literate individual is able to:
  - Determine the extent of information needed
  - Access the needed information effectively and efficiently
  - Evaluate information and its sources critically
  - Incorporate selected information into one's knowledge base
  - Use information effectively to accomplish a specific purpose
  - Understand the economic, legal, and social issues surrounding the use of information, and access and use information ethically and legally

III. **Written Communication** *Students will use technology to write, edit, and design printed documents.*
- Applications: Word, Pages, Google Docs
- Grades 6-8, across the curriculum
- Students will write, edit and design written documents for the purpose of clearly communicating concepts to teachers and classmates. Students will gain experience with a variety of software applications including Microsoft Word, Apple's Pages and Google Docs. Students have a variety of experiences in this domain throughout their Middle School careers. In many classes, students create written documents to submit homework assignments, as well as writing essays and paragraphs. They also design and publish posters, newsletters, brochures, and other written documents. In English class, students develop their revision and peer editing skills and also practice literary analysis skills through their written work. In Science, students collaborate on lab reports. Essay writing and document-based questions (DBQ's) are a focus in Social Studies. World Language students embed grammatical structures into written dialogues and short stories.

IV. **Presentation Software** *Students will learn to create and use presentations and multimedia software.*
- Applications: PowerPoint, Keynote, Google Slides
- Grades 6-8, across the curriculum
- Students will create multimedia presentations for the purpose of communicating research and other concepts to teachers and classmates. Students will gain experience with a variety of software applications including Microsoft PowerPoint and Apple's Keynote, as well as cloud-based solutions like Google Slides. All platforms require students to plan, organize, make design and editing choices, and learn how to use images, video, and audio elements effectively. Multimedia projects have allowed students in all subject areas to present in class and other venues.

V. **Spreadsheets, Charts and Graphs, Databases** *Use and create spreadsheets and databases, charts, and graphs.*
- Applications: Excel, Numbers, Google Sheets, FileMaker Pro
- Grade 6, computer quarterly, grade 8 technology
- Students will use spreadsheet applications to create tables for presenting information clearly. Increasingly, students will use spreadsheets to analyze data including sorting, searching and filtering, creating charts and graphs, and applying functions and calculations. Students will be introduced to Microsoft Excel and Google Sheets, possibly Apple's Numbers application and, in Science and Social Studies, dedicated tools for data analysis and graphing.

VI. **Web Design** *Design Web Pages*
- Applications: Google Sites
- Grade 7, Social Studies
- Students will learn how to design a Web site by modifying a template and, with more experience, creating an original site. They will learn how to create and format pages whose elements include text, images and hyperlinks. Students using Google Sites will learn how to embed content from Google Drive and other Google resources. While students' primary web design experience has been through portfolio work in seventh grade Social Studies, these approaches are increasingly being applied on a team level and in other departments.

VII. **Image Editing** *Create/edit an image*
- Applications: Preview, Photoshop
- Grade 8, Related Arts
- Students will learn how to create original content and edit existing content using a variety of utilities and software applications. Students will learn how to save documents into different file types and sizes. They will learn about rotating and cropping images, and they will learn about about making adjustments to color, brightness and contrast settings. By the end of eighth grade, students will use a number of Photoshop's tools and filters for projects in art and technology classes, as well as for projects in other subject areas.

VIII. **Design Objects** *Design objects, illustrations, diagrams*
- Applications: Illustrator, Inspiration, Google SketchUp
- Grade 6-8, Related Arts
- Students are given opportunities to use a variety of tools to design two and three dimensional diagrams and objects. In 7th grade Technology,, students will have the opportunity to build or fabricate objects of their own design.

IX. **Digital Video** *Create an original video project.*
- Applications: iMovie, Final Cut Pro
- Grades 6-8, across the curriculum
- Students will learn and apply the skills of video editing to original documentary or narrative school projects. Working independently and with others, students will storyboard, shoot, edit, and prepare a final video project in a variety of academic areas. The Middle School's primary platform for digital video is Apple's iMovie, which students use as a part of a creative suite that includes Garageband and

Photos. While digital video projects of all kinds can be found in any subject area, teachers often encourage students to use video to present information, including research, often with a specific point of view, about a topic of study or interest. Digital video is also used to document a process or event.

X.   **Audio Technology: Sound and Music**

    A. **Music Composition** *Compose and arrange music*
- Applications: Sibelius, Noteflight, Garageband
- 6th grade Exploring Music
- Students will learn how to score an original piece of music using notation software. They will learn to use audio editing software to compose, arrange and edit music. Students will learn how to record original music as well as assemble and edit pre-recorded loops and sound samples. They will learn the options for exporting finished work to use as stand-alone work or as a part of a multimedia project.

    B. **Podcast Creation** *Create a podcast or audio story*
- Applications: Garageband, Audacity
- Varies across curriculum
- Students will use audio editing software to create original sound recordings. Students will learn how to record original sound as well as create a finished piece using both original and pre-recorded sound samples in a multi-track editing environment. They will learn the options for exporting finished work to use as stand-alone work or as part of a multimedia project.

XI.   **Mapping** *Use location/mapping technology.*
- Applications: Google Earth/Google Maps, Geocaching
- Varies across curriculum
- Students will learn how to apply digital mapping resources to geography-related questions across the curriculum, including how to locate and examine places and distances. They will also learn how online mapping technology allows users to understand essential questions through a geospatial lens. Students will learn how to create and share custom maps that can be used with other software applications.

XII.   **Coding** *Use coding, including programmable circuit boards*
- Applications: Scratch, Tynker, LiveCode, Ardublocks
- Grade 6, Computer Quarterly and Technology Class
- Students will learn the fundamentals of programming and design using the visual coding platforms Scratch and Arduino. Students learn core computational and mathematical concepts that are consistent with mainstream programming languages. This work develops problem-solving, creativity and reasoning skills. Most importantly, students gain important experience and skill with a critical project design process: thinking creatively, communicating clearly, analyzing systematically, collaborating effectively, designing iteratively, and learning continuously. Quarterly students create games, simulations, animations, music, art and interactive stories.

Digital Experiences

Scarsdale Middle School students are provided with instruction in essential digital literacies like digital citizenship and research skills, as well as a number of activities which enrich a student's computer experience.

A. **Internet Literacy, including Social Media**

   Students use technology as a means of communicating and accessing information, including using District email and official school and teacher Web Sites.

   Students use school-related Social Media sites and applications, including blogs, wikis, Google Classroom, Edmodo, and Twitter.

B. **Mathematical Applications**

   Students learn to examine mathematical functions (graphing calculators, software, or apps).

C. **Educational Gaming**

   Students are given the opportunity to use or create digital games.

D. **Maker Experience**

   Students are given the opportunity to create and design in a maker-space environment. This is an emerging program that features the creation of a Music Makerspace using digital audio components

E. **Videoconferencing**

   Students are given the opportunity to participate in video conferencing to access information and interact with people around the world.

F. **Recording Assessment**

   Students in music classes and ensembles will assess their performance through an online assessment

The Middle School Library Media Center

In the Middle School Library Media Center, technology plays a central role in the instructional program. A dedicated library classroom provides a centralized space for instruction and presentations. Students are taught advanced techniques for searching the online catalog, extensive database offerings, and the Internet.

Keeping abreast of publishing trends, eBook versions of our reference books have been added to the library's catalog. This makes it possible for an entire class to have access to a reference book rather than one student using the book. In addition, classes participate in

videoconferences to experience real world applications of the science, math, and social studies concepts they are learning. With the addition of interactive tools to the library catalog, students will be able to recommend books to one another.

Middle School students have access to the following resources both at school and at home:

- ABC Clio Series
- Britannica ImageQuest
- Proquest Historical Newspapers
- Maps 101
- WorldBook Online Encyclopedia
- Grolier Online Encyclopedia
- Greenr
- Teen Health and Wellness
- InfoTrac
- BrainPop

In addition, the Middle School Library offers students and faculty 24/7, free access to thousands of ebooks and digital audiobooks through OverDrive.

Technology use at Scarsdale High School

Building on the foundations developed in elementary and Middle School, students at the High School have the opportunity to use technology to empower their learning independently and within the context of specific units of study. The instructional technology program provides a variety of digital tools and specialized applications emphasizing research, problem solving, communication and design. Students and staff have access to numerous devices (desktop and mobile) in classrooms and common areas; an increased number of mobile devices in classrooms (Chromebooks and Dell laptops) provide teachers and students with seamless access to tools and resources. Three computer teachers partner with faculty in collaborative instruction, provide technology professional development, provide support to students and staff, and teach computer science courses. Computer aides also provide technical support for hardware and software use.

Through a variety of learning management tools (Schoolwires, Google Classroom, TurnItIn) teachers supplement classroom instruction with resources that allow students to review and practice at a customized pace. These learning management tools also allow teachers to digitize assessments for more immediate student feedback, allow for faster grading and returning of materials to students, and provide a more organized and coherent place for student and teacher exchange.

Technology is integrated in all High School departments with the goal of preparing students to learn effectively and live productively in our digital world as responsible digital citizens. All students use technology tools to curate their knowledge and creatively communicate understanding. The High School has adopted a set of technology expectations for each Department that provide a framework for consistency of instruction. It should be noted that students and teachers often have additional opportunities to use technology beyond the competencies described in the list of expectations.

High School Departmental Technology Expectations

Art

- Use digital still and video cameras for student projects and to capture student work
- Use peripherals (scanners) to digitize images from film or print
- Use digital graphics and 3D animation software
- Incorporate new technologies and circuitry into curriculum
- Use Internet resources to research artists and works of art
- Use technology to showcase student work

Students will continue to use digital SLR cameras in Digital Photography I, II, Video, and Advanced Studio in Photography/Digital Video courses, and Prosumer digital video cameras and equipment are in Digital Video courses. Art teachers will regularly use digital cameras in all classes to document student work for future lessons, to share with the school community and to help students create college portfolios. Students in Studio Art Foundation will have at least one digital art experience during their semester or year-long course of study.

Students will use the Adobe Creative Suite in digital art classes, with Photoshop, Illustrator, and Premiere Pro receiving the most extensive usage in Digital Photography, Graphic Arts, and Digital Video, respectively. Students in Computer Animation I and II will use Cinema 4D to create three dimensional characters, environments, sophisticated motion graphics, and animated videos. Architecture I and II students will use Tinkercad and Google Sketchup to model their designs.

Art Department facilities have been upgraded over the past few years to support technology. In addition to two fully functioning art media labs, the Department houses a professional lighting studio, complete with spotlights, soft boxes, staging area, and a green screen. In addition to digital art classes who use this space for photo and video shoots, AT Studio Art teachers often use it to shoot portfolios, school government officers use it to record election videos, non-art students create independent projects for other classes here, and teachers use it to create projects to support school-wide events, such as MLK Day. Adjacent to the lighting studio is a separate room for sound design used primarily by Computer Animation classes.

The Department recently acquired new production equipment including a 3D printer and a laser engraver/cutting system. Teachers participated in a professional development day at Teachers College during which they experimented with circuitry and stop-motion animation. Some art teachers have begun to incorporate simple circuitry into Studio Art Foundation projects.

Art students and teachers in all classes will continue to use Internet resources to explore various artists, art movements, and specific works of art. In addition to sharing student work in-house on the new flat screen display in The Positive Space Gallery, the department will continue to showcase student work on our Schoolwires Art Department site.

The department will continue to incorporate the use of technology into the curriculum, from freshman foundation courses to advanced topics courses. Art students will create portfolio websites to showcase their work.

The Alternative School (A-School)

In addition to using technology in their subject area classes, A-School students:
- Use technology to facilitate the A-School's democracy-driven culture by enhancing the efficiency and privacy of voting (student response systems)
- Use technology to support communication with a global community (video conferencing)

Design, Engineering and Technology

Electives in design, engineering, and technology offer students the chance to develop computational thinking, explore innovative design, and work collaboratively.

Students in computer science courses will continue to investigate the following topics at the introductory and advanced levels: program design, principles of object-oriented programming, programming constructs, testing and debugging programs, analysis of algorithms, standard data structures, standard algorithms, recursion, and responsible use of technology.

A new STEAM curriculum will provide students with hands-on learning experiences through open-ended projects in which they will design, prototype, and test solutions to authentic, human-centered problems.

English

• Use technology to facilitate the reading and composition process
• Create visual essays and persuasive arguments using a variety of multimedia tools
• Use appropriate research resources to support student composition
• Use digital tools to publish with correct format and citation
• Assess Web-based information for reliability

English students utilize a wide variety of technology resources to facilitate the research/writing/publishing process. Students will continue to publish in a variety of formats (essays, brochures, posters, newspapers, comics, blogs) using a variety of programs and online tools. Students in a senior year elective will continue to write, perform, and edit digital videos. Students learn to verify the reliability of online information and use the subscription databases for research. Resources are used to investigate the background and historical context of readings, as well as for traditional literary research.

The implementation of 1:1 devices (Chromebooks) in English classrooms facilitates the writing process, allowing for real time feedback and student-centered research. Online collaborative tools (Google Docs) encourage close text analysis and promote a constructive community approach to learning.

Students in 9th Grade English contribute writing samples and reflections to a digital writing portfolio (using Google Sites) that they will continue throughout their High School career.

Health Goals

Students in health classes use online resources (subscription databases) to research current events, issues and diseases in health and nutrition. They use use a variety of multimedia tools (slide shows, videos, comics, pamphlets/brochures, posters, infographics) to present and share their research.

The High School Library Media Center

The SHS Library Media Center is a vibrant, active place that provides spaces for individual and group work as well as classroom learning. While many students bring their own devices and take advantage of the school's wireless network, we also have desktops and mobile devices available for students. Access is paramount, not only to the network and hardware, but also to the plethora of online resources available to students 24/7 in and outside of the library.

The High School Library Media website provides access to numerous subscription databases, periodicals, eBooks and project guides, featuring 40+ online subscription databases (ABC-CLIO, Gale, Facts on File, JStor, LexisNexis, ProQuest and more), a federated periodicals search (Serials Solutions) and eBook Collections (Gale, Morgan Reynolds, Salem, Follett, ABC-CLIO). Through collaboration with subject area teachers, information literacy skills are taught in conjunction with authentic research projects. These skills are determined by national and local standards and are enumerated in the District's K-12 library curriculum. Students are encouraged to become efficient and effective users of information.

Mathematics Goals

- Use graphing calculators as problem-solving tools and to explore real world principles.
- Use the graphing calculator and/or technology as a hands-on approach to the concepts developed analytically in the classroom.
- Use spreadsheets for problem-solving, data analysis, and graphic display

- Investigate mathematical concepts using appropriate local software (GeoGebra, Winplot) or web-based resources.
- Design and build prototypes using Little Bits (used in Applications course; magnetic manipulatives that form circuits)
- Create digital designs for 3D models using modeling tools (TinkerCAD)
- Analyze data using statistical software (R, R Studio) to analyze data (AT Statistics courses).
- Use digital assessments to enhance instruction and communication (student response system, immediate feedback, Remind.com).

The handheld graphing calculator will continue to be a primary tool used by students at all levels, from honors to skills, throughout their high school experience.

Applications such as Geometer's Sketchpad, WinPlot, R, Algebra in Motion and Calculus in Motion as well as Internet sites will provide simulations and opportunities to investigate mathematical concepts.

All students in high honors pre-calculus will study basic programming, and will write programs to perform intricate calculations such as Riemann sums.

Performing Arts

The High School Performing Arts Department uses technologies on a consistent and regular basis in all aspects of the curriculum.

In the ensembles, professional performances of repertoire being studied are often accessed and assessed. This is followed by a similar analysis and reflection of our own rehearsals and performances which are recorded aurally and/or visually. In academic courses, technology facilitates document sharing, research of historical data, and editing of compositions, as well as reference to interdisciplinary connections.

In addition to web-based resources, students have access to specialty software in appreciation, theory, digital music and theater tech courses (Finale, Sibelius, Pro Tools, Audacity and QLab).

Physical Education / Athletics

- Use technology to track and assess physical activity/fitness
- Use video for assessment (teacher, self, and peer assessment)

Technology that measures and tracks physical activity is widely available and open platform. Physical Education faculty leverage this convergence of fitness and technology in their curriculum to make fitness more interactive and engaging, to emphasize the importance of regular physical activity in lifelong health, and to help students make informed fitness decisions.

Faculty regularly incorporate technology into classes to demonstrate activities and to assess student performance. They use the FitnessGram program to facilitate student fitness levels and perform pre and post assessments and assess daily performance using Infinite Campus. Teachers video class activity (iPads) and share with students for self- and peer-assessment.

Students in their junior and senior years complete an "iFit" unit which introduces a number of widely available personal fitness apps. Teachers introduce and demonstrate apps which students try in class; students are encouraged to continue to explore them outside of class and bring their findings back to the group.

Science

- Use technology to collect, organize, and analyze data
- Use simulations to investigate real-world and ideal systems
- Access information from local and web-based sources
- Create scientific reports using appropriate applications
- Create digital presentations to communicate concepts and document research

Using technology to collect data is an important skill developed in all science classes. A variety of computer-based probes will continue to be used in biology, chemistry and physics classes. In virtually all cases, experimental data will continue to be organized, plotted, and analyzed using the program Graphical Analysis.

Biology classes will continue to use local simulation software to investigate scientific principles. Students in physics classes will continue to use Interactive Physics as well as Web-based applets to investigate laws of mechanics, optics, electrodynamics, and nuclear physics.

Earth science classes will continue to use Geographic Information System software to map regions of the Earth showing physical, demographic, and man-made characteristics. The department will also use Google Earth as a tool to analyze geological data. Internet resources will continue to be used to analyze real-time data in the study of meteorology and tectonics.

In the Science Research course, technology is an integral part of the entire curriculum. Students will continue to use technology to mine databases for primary sources of literature, to collect and analyze data amassed during their experiments, and using presentation software to present their findings to the larger scientific community.

Members of the department will be involved in compiling and categorizing a database of online resources. In addition, teachers will continue and expand the use of SmartBoard software to create and record lessons to post to their webpages.

Physics classes will use a variety of apps that simulate, capture, and analyze motion.

Special Education/Learning Resource Center

The Special Education Department currently provides assistive technology support to many students in the High School. Students have access to a variety of software and online tools (apps and extensions) in classrooms and in the LRC to aid students who struggle with listening, organizing, documentation, reading and writing:

- speech synthesizers
- audio books/publications
- notetaking and citation
- graphic organizers and outlining
- speech recognition
- word prediction
- proofreading
- talking spell-checkers and electronic dictionaries

Portable devices (such as iPads) are provided to students based on the requirements of the child's Individualized Educational Plan (IEP). In addition to facilitating academic tasks, assistive technologies help students achieve greater levels of independence, gain confidence and more willingly reach out to teachers and peers to ask questions and collaborate.

Social Studies

- Use the new classroom-based Chromebooks to support student research and classroom presentations.
- Use a variety of web-based resources and programs to examine and analyze information.

Students at all grade levels will continue to digital resources to research both historic and current events.

World Language

- Use technology develop their ability to comprehend and communicate in the target language.
- Use technology resources to research, review, and practice in the target language.
- Use video conference technology to communicate with counterparts in other countries.
- Use the new classroom-based Chromebooks to support student research and classroom presentations.

Students enrolled in World Language classes will continue to publish in a variety of formats, incorporating text, graphics, and audio recordings. Research for the projects will involve both print and electronic media. Students will continue to use web-based sources, scanners, and

digital cameras as well as digital tools (Comic Life, Google Docs, VoiceThread, Audacity) to produce publications, write, share, collaborate, and communicate in the target language.

Students will create multimedia presentations including narration in the target language and classes will film, edit, and perform in original digital video presentations with dialogue in the target language. Students will continue to create audio files for both practice and for assessment and Internet sites will continue to be used to access current events programming and newspapers, language practice (conjuguemos.com; classzone.com; quia.com) as well as artworks and aspects of the target language's culture.

Teachers will continue and expand the use of interactive whiteboard software to create and record class instruction. Teachers will expand the use of the audio file and file posting on webpages to give the students access to class lessons for review.

Students enrolled in Spanish and French classes will continue to create written documents in a variety of formats, incorporating both text and graphics. Research for the projects will involve both print and electronic media. Students will continue to access images from the Web, use scanners and digital cameras, as well as desktop publishing software to produce publications.

Classes will film, edit, and perform in original digital video presentations, and slide shows will continue to be created with narration in the target language. Students will continue to create audio files for both practice and for assessment, and Internet sites will continue to be used to access current events programming and newspapers, language practice (using Websites like conjuguemos.com; classzone.com; quia.com) as well as artwork and aspects of the target language's culture.

Teachers will continue and expand the use of SmartBoard software to create and record class lessons. Teachers will increasingly use podcasts and file posting on webpages to give the students access to class lessons for review.

K-12 Instructional Technology Recommendations

Continue to evaluate the 1:1 and department-based Chromebook computer initiatives
The District should explore the implementation of a student laptop program by carefully studying its total cost of ownership (TCO) and its potential for enhancing the educational program.

Promote online publishing opportunities for students and teachers
The District should continue to examine opportunities for student and teacher publishing at all levels, including the use of blogs, Wikis, and podcasts.

Increase opportunities for students to study coding and constructivist environments
Students at all levels need to understand how to code and develop computational thinking skills through authentic problem-solving experiences.

Examine facility and furniture configurations in labs and classrooms to determine how to best support the use of mobile technology
The reconfiguration of library learning spaces, as well as the new Middle School NEST, provide opportunities for students to work in flexible learning environments. Other learning spaces that can be reconfigured to support mobile learning should be identified.

Create a plan for upgrading classroom presentation technology
As SMART Boards continue to age, the District needs to evaluate options for moving from LCD projection technology to LED screens.

Engage in a legal review of technology policies every year instead of every three years
Past practice called for a technology legal review every three years. Given the rapid acceleration of technology adoption and changes to the technology landscape, technology policies should be reviewed annually.

Continue to support parents, students, and teachers in their use of technology, and help them understand the importance of safe and effective technology use
The PT Council has worked with the technology staff to present programs for parents about the safe use of social media. Some librarians have hosted parent meetings on effective use of online technology resources. The District should continue to support technology education that emphasizes both the positive and negative aspects of technology use by all members of the Scarsdale community.

Continue to assess the program with annual reports
The technology assessment plan provides a structure for the computer staff to formally evaluate the use of instructional technology and make mid-course adjustments. The computer staff should continue to provide data for an annual technology report via a Board presentation.

Instructional Technology Grade Level Recommendations

Elementary Recommendations

- Continue to foster collaboration among computer teachers, librarians, ELA Helping Teachers, art teachers and other specialists to support classroom teachers in the use of technology
- Expand the 1:1 program to third grade classrooms and increase access to iPads in grades K-2
- Continue to have conversations with teachers about the role of the "New Literacies." *The reading and comprehension skills necessary to interpret text on Internet sites are significantly different than the skills required for traditional print resources. Scarsdale should become a leader in studying the New Literacies by partnering with national experts in this important area of research.*

Middle School Recommendations

- Continue to expand the use of Web-based applications
- *An increasing number of Middle School teachers have successfully used Edmodo, blogs, and other online services to enhance classroom instruction. Schoolwires also supports online instruction, and the use of additional third party Web-based tools should be adopted.*
- Study the use of student devices for instructional support.
- *The Middle School technology committee will analyze how the increased use of mobile technology enhances instruction.*
- Continue to examine how technology can foster critical and creative thinking in all subject areas, including the use of technology for authentic assessment.

High School Recommendations

- Use technology to foster interdisciplinary projects among departments.
- Study the impact of the "bring your own device" (BYOD) program on student learning.
- Design and offer a variety of effective professional development experiences to meet the specific needs of High School faculty
- Continue to explore new technologies and new genres of educational software
  As new instructional technologies are developed, especially Web-based resources, the District should provide opportunities for staff to explore their use in the classroom. Pilot projects involving the use of technology should continue to be encouraged.
- Increase opportunities for students to engage in coding and problem-solving experiences supported by technology
- Explore the use of new technology in physical education classes

Assessing the Use of Technology

The following procedures have been established to formally assess the technology program:

Elementary

Elementary classroom teachers, library media specialists, and computer teachers collaborate to plan and deliver appropriate technology experiences to students. At the end of each school year, the elementary computer teachers report their school's progress to the Head Elementary Computer teacher and the Director of Instructional Technology. The Technology Projects database will be reviewed to determine how teachers are using technology. In addition, the Capstone research project will be used to evaluate the ability of students to use technology for research and presentations. The computer teachers will meet each summer to share progress with competencies and suggesting revisions if appropriate.

Middle School

The Middle School teachers and department chairs have developed a comprehensive set of standards for information fluency (research) and technology skills in grades 6-8 that connects with work in the elementary schools as well as the High School. In addition, they have developed a sense of "ownership" for these standards within departments, teams and houses.

At the conclusion of the school year, the Head Middle School Computer Teacher will meet with the Director of Instructional Technology to discuss progress for each department. Recommendations will be discussed to promote the continued development of technology expectations in all grades, and these recommendations will be shared with the Middle School Principal and department chairs

High School

High School Department Chairs report progress on specific computer expectations to the Head Computer Teachers annually, who will prepare a report before the end of the school year that summarizes progress with competencies and suggesting revisions if appropriate. The report will be presented to the Director of Instructional Technology and High School Principal during an annual "year in review" meeting. In addition, the computer teachers will meet with the Director of Instructional Technology to review the sequence of computer programming classes and make recommendations for changes based on teacher experiences and student feedback.

District

The Director of Instructional Technology will continue to prepare and deliver a presentation to the Board of Education and the Scarsdale community that describes the opportunities and challenges of the District's use of technology. Every three years, a new technology plan will be created and presented to the Board.

Professional Development and Support

Technology as an Instructional Tool

The District believes that all staff should use technology, when appropriate, to enhance the educational program. This includes providing students with experiences that use technology in meaningful and appropriate ways. In addition, teachers are encouraged to teach with technology whenever appropriate resources are available.

Expectations for staff are based on the content of the competencies outlined for each grade level or adopted by each department. Multiple resources in the District, including the computer teachers and the STI, are committed to helping teachers expand their competencies.

All staff members are required to attend three hours of technology training outside of school hours. In prior years, workshops focused on Digital Citizenship and other topics. This year, teachers have an opportunity to participate in one-hour mini workshops sponsored by the ST@C, a project created with a grant from the Scarsdale Center for Innovation.

Technology Training

Training provides teachers with the technical knowledge for using hardware and software in the classroom. For example, a teacher may be trained to use a digital camera and transfer images to a computer. *Staff development* addresses issues related to using technology to enhance the teaching/learning process. Staff development includes broad-based issues related to the philosophy of using computers in the classroom, a discussion of the pedagogical rationale for computer based projects, and classroom management strategies. While training is relatively easy to support, staff development is a complex process that involves a high level of engagement and ongoing conversations with teachers. For example, a teacher may be very comfortable using computers, but may not be able to effectively integrate the use of computers in a classroom environment. *Support* is the process of ongoing technology training and staff development.

The primary agents of staff development in the District are the computer teachers, library media specialists, and ELA Helping Teachers.Staff development and technology training for teachers takes many forms, including:

Individualized Training

The computer teacher provides one‑on‑one direct instruction to the classroom teacher.

Staff Development Workshops

A group of teachers attends a workshop which focuses on a specific topic.

Teacher Consultation
A computer teacher meets with a classroom teacher to discuss options for a computer project, and recommends software, as well as suggesting strategies for managing the project.

Collegial Coaching
A computer teacher collaborates with classroom teacher(s) to co-plan and co-teach a technology integrated project. The computer teacher makes recommendations for software, as well as suggests instructional strategies to help implement the project. The computer teacher models lessons for the classroom teacher and observes lessons by the classroom teacher in an effort to help both teachers improve student learning.

All teachers are required to complete three hours of professional development in technology every year. Teachers were also asked to attend one-hour scenario-based Digital Citizenship workshops that covered important topics related to Internet safety and legal issues.

The Scarsdale Teachers Institute

The Scarsdale Teachers Institute (STI) serves as an important component of the technology staff development program. As one of the established Teacher Resource and Computer Training Centers of New York State, it is governed by a Policy Board comprised of teachers, administrators, university professors, community residents and parents. As one of the founding members of the Lower Hudson Teacher Center Network, the Scarsdale Teachers Institute collaborates and cooperates with other teacher centers to provide professional growth opportunities for the entire educational community.

The STI offers courses in a variety of formats, including six-week courses, weekend courses, research projects, and mini-grants.

A partial list of technology courses offered in recent school years includes:

- The Digital Writing Workshop
- Using Geogebra in the Mathematics Classroom
- Interactive Digital Books
- Sharing Best Technology Practices in the Science Classroom

STI technology courses are offered at several levels to accommodate ongoing growth of staff. In addition, the STI offers courses that support the work of specific departments.

Computer Teacher Staff Development
Technology staff must keep abreast of new technologies and instructional approaches. Since they serve as educational leaders and staff development specialists, they must also be provided with opportunities for professional development. The District supports the professional growth of

computer teachers by encouraging them to work with consultants, attend and present at educational conferences, participate in site visits, and attend lectures and workshops offered by educational organizations and technology vendors.

This year, some members of the computer staff attended the *Technology and Learning TechForum* and the Lower Hudson Regional Information Center's *TechExpo*, where members of our computer staff presented their work for other educators in the region. In addition, computer teachers attend LHRIC Technology Leadership Institute presentations. The Institute brings leading experts in instructional technology to our region, allowing our staff to learn about the latest technology trends without the typical travel costs associated with attending a conference.

Recommendations

Continue to use the computer teachers, library media specialists, and the ELA Helping Teachers as the primary source of staff development experiences.
Computer teachers provide staff development by examining staff development needs, working individually with colleagues, and planning and presenting workshops.

Expand the variety of staff development offerings.
Online courses, streaming video, and online tutorials allow teachers to have access to training that can take place "anytime, anywhere." The District, in partnership with the STI, should continue to investigate how technology can be used to provide staff development experiences.

Continue to offer STI courses that attract teachers of varying technology proficiency.
An annual spring review of STI computer courses helps prepare the fall/winter STI program. The review will guide the creation of new technology courses, Summer Institutes, and other staff development experiences.

Offer differentiated training opportunities to address the increasing specialized applications of technology.
Staff development should include courses and workshops targeted to staff members who possess different technology needs.

Information Technology

The Information Technology department is comprised of the Data Services and the Technical Services teams. The Director of Information Technology and Chief Information Officer oversees the department.

The **Data Services** team supports the administrators, administrative support staff, counselors, psychologists, nurses, and custodial staff throughout the District in their use of technology to enhance services and allow efficient operations of their departments. The team also manages the critical communications infrastructure of the District, including email, the Infinite Campus Parent Portal, and Connect-Ed, the District's emergency notification system. In addition, the team is responsible for student and census data collection, analysis, and state reporting. As it pertains to non-instructional systems, the team collects system requirements, evaluates system solutions, negotiates vendor contracts, project manages the implementation of software applications, manages vendor relationships, manages software upgrades, designs and implements data interfaces, and manages user accounts.

The Data Services team manages many software applications, including:

- Infinite Campus - the student information system including census information, district-wide attendance reporting, student scheduling, health records, report cards, etc.
- Google Apps for Education - the district-wide email, calendar, and collaboration system
- CSI/SMARTS - the system to support personnel and finance
- Blackboard Connect-Ed - the District's emergency notification system
- Schoolwires - the District's web content management system
- Destiny by Follett - the library system
- Nutrikids and mySchoolBucks - the food services system and its parent portal
- Transfinder - the transportation system
- PTC Wizard - the parent-teacher conference scheduling system
- Aesop - teacher substitute placement and absence management system
- MyLearningPlan - the professional development management and tracking system
- DRA Online by Pearson - the system used by the elementary schools for reading assessments
- STAR Assessment by Renaissance Learning - the Elementary screening assessment
- FitnessGram - the system used by the Physical Education department for measuring student fitness

The team is also responsible for all state and federal reporting related to student data and teacher evaluation, as well as parts of PD, BEDS, SAMS, and CRDC reporting.

The Data Services team also supports an increasing amount of ad-hoc data reporting and data visualization requests from staff throughout the District. The team continues to design

technology solutions, implement new systems, and re-engineer processes to create efficiencies, reduce cost, improve data accuracy, and foster school/home communication. Examples of such initiatives are the planned implementation of the Infinite Campus Online Student Registration module which will allow families to register their children via a secure online system, and the implementation of My Learning Plan which will allow the District to centrally manage and track professional development.

The **Technical Services** team is responsible for the management of end-user computing, network and server infrastructure, the District's phone system, and television & audiovisual services.

The network staff is responsible for configuring, updating and managing the District's Apple, Novell, and Windows servers and for building computer images that allow the team to clone computers and push out updates. The District servers support computer applications, teacher data, student data, library automation, administrative computing and other network services. During the last school year, crucial upgrades to the core technology infrastructure were made, including:

- upgrade of the fiber-optic backbone and replacement of network switches in every building. The upgrade was critical to ensure a reliable network infrastructure. Furthermore, the upgrade increased the network bandwidth from 1GB to 10GB, providing the necessary bandwidth to support the increased number of mobile devices as illustrated in the instructional technology plan.

- upgrade of the elementary, Middle and High School wireless networks which included network cabling to accommodate the next generation wireless access points (802.11ac), as well as the installation of access points in every classroom and common areas.

- Implementation of a Voice over IP phone system and integration of the system with the existing speaker system.

- Implementation of a Help Desk system to streamline technical services operations.

Highlights of planned network and server projects are:

- Migration of Novell servers and Apple OS infrastructure to Windows servers and Active Directory
- Increased use of virtualized servers
- Implementing a new Windows and Mac computer management solution
- Implementing and expanding the Mobile Device Management Solution (MDM)
- Upgrading backup systems
- Upgrading the current Internet filtering system to accommodate increased bandwidth requirements.

- Installing a Matrix electrical panel UPS power backup system for the District's main wiring/server closet
- Installing redundant Core switches for the High School and Middle School for automatic failover, i.e. fault tolerance
- Upgrade the Lightpath wide-area network (WAN) from 1GB to 10GB

The Technical Services team is responsible for purchasing all computers, electronic equipment, and technical service contracts. The team inventories and supports all desktop computers, laptops, Chromebooks, and tablets in the District, as well as hundreds of printers, scanners, Smartboards, digital cameras, document cameras and other peripherals in labs, libraries, classrooms, and offices. Current hardware purchasing projections indicate that the computer/laptop/Chromebook/tablet additions will increase the active hardware count to over 5,000 devices.

The District has committed to a four-year hardware purchase/replacement cycle for desktop and laptop computers. All other equipment is replaced when it is no longer useful, but no sooner than four years after it has been purchased. With the increased deployment of mobile devices and one-to-one programs, the need for equipment repairs has grown exponentially. Certified technicians in the Technical Services team are dealer-authorized to perform on-site repairs for Apple, Dell, and Acer products.

The Technical Services team produces all video programming for the school community. This includes the Educational Access Channel (Cable 77) for Cablevision customers and (Cable 27) for Verizon customers which also broadcasts to the Scarsdale community. Television productions include:

- Board meetings
- Scarsdale TV bulletin board messages and emergency notifications
- Sporting events and performances
- Guest speakers
- Special projects

All aspects of video production are completed in-house, including editing, archiving, and delivery. A complete listing of updated programming can be found on the District Web site, www.scarsdaleschools.org/tv

Furthermore, the team also provides a variety of audiovisual services, including:
- Installation, repair and maintenance of audiovisual equipment, SmartBoards, and Data Projectors
- Training faculty and students on the use of audiovisual equipment
- Installation and configuration of equipment, and setup for speakers, events, and workshops
- Operation and maintenance of the sound systems in school auditoriums

Planned audiovisual projects include:

- Installation of the High School Fitness Center Audiovisual and Computer Interactive Media system

- Replace existing Smartboards with LED screens (subject to SMART Schools Bond funds)

Funding Technology Needs

The District purchases computer equipment and peripherals using a four-year hardware lease/purchase agreement. Old or obsolete hardware is recycled at the end of the year, and the District receives revenue from a recycling company that goes into the general operating fund. In addition, the District participates in the federal eRate program that provides partial reimbursement for technology operations.

Software is typically purchased through educational licensing and maintenance agreements, allowing for cost savings. Whenever possible, the District uses software licensing to reduce the cost of purchasing commercial software. In addition, the District purchases education licenses of software products that are significantly reduced from the price of consumer versions. New York State provides the District with approximately $75,000 of funding for software each year to offset budget costs.

The tables on the following pages outline the hardware lease/purchase plan for the next three years, as well as the implementation plan for technology projects. Detailed hardware and software purchasing projections are developed in January and are reviewed by technology committees and District administration before being presented to the Board in February. Obsolete hardware is identified for replacement, and a program needs assessment determines new hardware that will be purchased. These plans are reviewed with members of the District K-12 Technology Committee. Purchasing plans are finalized in May, and orders are typically placed in late June/early July.

Instructional Technology Budget Projection

The three-year budget projection provides summaries of detailed budgets that are used for planned instructional hardware purchases. *These projections only serve as estimates* - it's very difficult to predict hardware prices and needs for future years. Actual orders will be finalized each budget season, and these projections do not include funding for administrative technology. The *District* hardware category is used for funding hardware that is deployed District-wide, often used to fund new initiatives. Approximately $25,000 in the District budget is reserved for unanticipated expenses.

Year: 2016-2017

Budget Projection

Elementary	$405,000
Middle School	$421,000
High School	$387,000
District	$189,000
Total	$1,400,000

Year: 2017-2018

Budget Projection

Elementary	$405,000
Middle School	$421,000
High School	$387,000
District	$289,000
Total	$1,500,000

Year: 2018-2019

Budget Projection

Elementary	$405,000
Middle School	$421,000
High School	$387,000
District	$337,000
Total	$1,550,000

Technology Planning Timeline

	Spring 2016	Summer 2016
	• Publish technology plan draft • Present Education Report • Finalize hardware Budgets • Complete faculty surveys • Complete inventory and budget projection	• Order and configure hardware • Complete Summer Program Improvement Projects • Submit final technology plan to the state portal • Finalize K-5 Coding articulation

Fall 2016	Spring 2017	Summer 2017
• Review technology Plan goals • Complete faculty review of technology plan grade level and department expectations • Complete student focus groups	• Assess the implementation of new computer expectations • Assess the impact of new technology initiatives • Finalize hardware budgets • Present annual Technology Report	• Host Summer Technology Institute • Order and deliver hardware • Complete Summer Program Improvement Projects • Prepare for online testing

Fall 2017	Spring 2018	Summer 2018
• Prepare for technology plan review • Begin online testing	• Review software and online subscription utilization • Consultant review • Finalize hardware budgets • Present annual Technology Report	• Host Summer Technology Institute • Complete Summer Program Improvement Projects • Order and deliver hardware

Fall 2018	Spring 2019	
• Review computer expectations • Begin planning for new technology plan • Complete needs assessment	• Review software and online subscription utilization • Finalize hardware Budgets • Publish technology plan	

Appendix A: Informing our Vision

Members of the Technology Committee attended and presented at the following conferences in 2015 and 2016, allowing them to gather information about the latest technology trends:

National Conferences
COSN Annual Conference (http://cosn.org)
ISTE Annual Conference (http://iste.org)
New Media Consortium Summer Conference (http://www.nmc.org)
CIO Forum, Skywalker Ranch (http://www.techlearning.com/schoolcio-summit/overview/skywalker-ranch/30)
EduCon, Science Leadership Academy (http://2015.educon.org)

Regional Conferences
TechForumNY
Lower Hudson Tech Expo
Lower Hudson Technology Leadership Institute (TLI) Presentations

In addition, the Director of Instructional Technology and Innovation attended meetings of the following local organizations:

New York Technology Educators Network (NYTEN)
PNWBOCES Curriculum Council

Books
Amplify by Kristin Ziemke
From Master Teacher to Master Learner by Will Richardson
Start with Why by Simon Sinek
Program or Be Programmed (Douglas Rushkoff, Scarsdale High School graduate)

Featured Speakers
Will Richardson
Kristin Ziemke
David Loertscher

Websites
Common Sense Media
https://www.commonsensemedia.org
Creative Computing (The ScratchEd group, Harvard Graduate School of Education)
http://scratched.gse.harvard.edu/guide/
Exploring Computational Thinking (Google for Education)
https://www.google.com/edu/resources/programs/exploring-computational-thinking/
Information Literacy Competency Standards for Higher Education (ALA, 2000)
http://www.ala.org/acrl/sites/ala.org.acrl/files/content/standards/standards.pdf