



Technology Scope and Sequence

This policy was approved by the Board of Directors on July 14, 2008.

I. Introduction

American Academy in Lone Tree, Colorado, strives to be a leader in the use of technology to support teaching and learning in the classroom. At American Academy we do not teach technology, we use technology to teach. From our first year in 2005, technology has permeated our school in both infrastructure and curriculum with 90 student laptops networked for approximately 525 students to use everyday. We are dedicated to increasing our computer to student ratio every year to make technology an integral part of the curriculum with Internet and instructional software for grades K-8. Our school climate is an environment where teachers and students work towards proficiency in using a wide variety of tools to enhance learning, problem solving, communication, collaboration, productivity and creativity

American Academy has made every effort to align this technology plan with the National Educational Technology Standards developed by the International Society for technology in Education (ISTE).

II. Justification

Why should schools emphasize the use of technology? The decision to infuse technology throughout the American Academy curricula is based on solid research demonstrating enormous educational benefits for our students. Our students will gain two very important competencies:

- They will become technically skilled. From a very young age, our learners will understand how to use computers, digital cameras, and hand-held devices. Students will also become users of technology resources, software, and applications such as video-conferencing, Podcasting, computer aided drawing, web-site development, and animation as productive and innovative technical tools.
- They will use the internet and the flow of information gained to think, reason, analyze and compare. Our children will grow up in and work in a world that gives them access to massive amounts of information. At American Academy, students will learn how to access and validate information and understand the organization of information. In other words, they will become information literate and better prepared for the digital world in which they live.

The Center for Applied Research in Educational Technology (CARET) has carefully reviewed and reports results from many studies supporting the integration of technology use in schools. Studies show that academic achievement is markedly increased in schools where technology is integrated into the day to day learning environment. Furthermore, research evidence indicates that technology improves student performance when the specific application:

- Directly maintains the curriculum objectives being assessed;
- Provides opportunities for student collaboration;
- Adjusts for student ability and prior experience, and provides feedback to the student and teacher about student performance;
- Is integrated into the typical instructional day;
- Provides opportunities for students to design and implement projects that extend the curriculum content being assessed by a particular standardized test.

In addition to enhancing student performance, research reports clear findings that illustrate how technology can influence cognitive functioning especially in the area of critical thinking. Specifically noted in the literature is a measurable increase in higher order thinking skills, problem solving ability, conceptualization, and the logical application of information. The advanced development of these skills is directly connected to technology as it is used when students are allowed to work collaboratively and when students use technology presentation and communication tools to present, publish and share their work.

Finally, technology improves motivation, attitude, and interest in learning. Most teachers that use technology readily have experienced that technology has the ability to inspire students with low intrinsic motivation for academics. When students use computer applications to produce, demonstrate, and share their work with peers, teachers, and parents, these students are inspired. Motivation is also enhanced in all students, regardless of their ability or achievement, when technology uses challenging, game-like programs and applications designed to develop background skills and knowledge.

III. Mission Statement

American Academy will achieve academic excellence through a challenging sequenced curriculum that emphasizes science, technology, engineering, and math (STEM) to provide our children with the tools to become the leaders of tomorrow. Together, our students, faculty, parents, and community will cultivate character, civic responsibility, and intellectual development.

IV. Technology Vision Statement

American Academy will develop and maintain the technology infrastructure, supporting curricula, and professional development structure to become a standard for excellence in Colorado as a school that uses technology to empower the learning community. Our mission is to ensure for each student a comprehensive education that provides students with technological ability as well as empowers these students with literacy in information technologies and communications networks as they connect to resources brought to them through the Internet. Students will also be taught to apply their technological knowledge to solve problems through authentic learning experiences where they will be challenged to complete educational tasks in new and creative ways. Through technology empowerment, American Academy students will become critical thinkers and achieve a desire for life long learning in their personal, educational, and workplace environment.

V. Strategy

A. IMPLEMENTATION

American Academy will continually update and implement a comprehensive school wide technology plan for the effective integration of technology that will provide appropriate guidelines for acquisition, training, and support for staff, and students.

- Survey and research the most effective practices for technology integration in the school.
- Provide adequate technology resources to support students, staff, and parent community.
- Update the American Academy Technology Plan annually based upon evaluation data, research, recommendations from IT consultants, administration, staff, Board of Directors, and educational organizations such as the International Society for Technology in Education.
- Promote parent community outreach through a variety of offerings that may include, but not be limited to, “open technology” nights and/or instructional classes for parents.
- Disseminate information to assist in the purchase of American Academy comparable laptops for middle school students to use at school and at home.
- Update and maintain the American Academy website and STEM News homepage to include relevant information to the school community.

B. INFRASTRUCTURE

American Academy will maintain and upgrade a state-of-the-art network infrastructure to provide global communications and information literacy for school wide use with sufficient technical support to extend, further develop, and maintain optimal operation of the network.

- Utilize technology to support the curriculum and improve student achievement with an emphasis on classroom integration to facilitate implementation of American Academy’s technology standards for students, teachers and administrators.
- Evaluate and purchase emerging technologies to create and maintain expansive programs that challenge all learners.
- Maintain the hardware for efficient operation of the American Academy
- Each staff member is provided a laptop
 - Network and System Architecture – Main Campus

- 3Mb bonded T-1's to provide voice and data communications
- Cisco Call Manager Express Voice Over IP phone system utilizing Cisco Unity Express for voicemail capabilities
- 802.11b/g wireless network within the school campus
- Web filtering and web blocking for the campus network.
- Two Dell PowerEdge servers to provide access to applications, printers and file sharing
- Printers for a diverse set of requirements: HP color LaserJet for art classes; two high speed Canon ImageRunner printer/copiers for large print jobs, and 4 HP LaserJet black/white printers for general printing needs
- Epson and Hitachi projection systems for each classroom
- Support staff to maintain, backup, configure and support the servers and phone system and network
- Network/System Architecture Auxiliary Kindergarten Campus
 - Comcast high speed internet connection with secure VPN to the Main Campus.
- Approximately 90 Standard Student Laptops:
 - HP NC6120 laptop
 - Pentium M 1.6GHz processor
 - 512Mb of RAM
 - 40Gb hard drive
 - Media Card Reader and USB ports
 - Intel Pro Wireless adapter
- High-end Staff/Student Graphics Art Laptops:
 - - HP NX6125 laptop
 - AMD Turion 64 bit 2.2 GHz processor
 - 1GB of RAM
 - 60Gb hard drive
 - Media Card Reader and USB ports
 - Broadcom Wireless adapter
- Approximately 18 laptop and desktop Apple Macintoshes for Art and Music Departments
- Review and update available software titles currently available for use at American Academy:
 - **United Streaming**
Discovery Education *unitedstreaming* is a digital video-based learning resource from Discovery Education. With Discovery Education *unitedstreaming*, educators gain on-demand access to 50,000 content-specific segments from 5,000 full-length educational videos. Today, educators at more than 70,000 schools across the United States use *unitedstreaming* to integrate vibrant digital content into the curricula of more than 30 million students.
 - **Accelerated Reader**
Accelerated Reader, a Renaissance Learning Inc. product, is reading management software intended to help teachers guide students' independent reading practice and motivate students to read more books. Essentially, "AR" is an assessment that primarily determines whether a student has read a book, with more efficiency, speed, and accuracy than a book report because it is computer-scored. The software provides additional information to teachers regarding reading rates, amount of reading, and other variables related to reading.
 - **Classroom Performance System Software**
E-instruction's classroom performance system (CPS) is an infra-red response system that obtains immediate feedback from every student via the use of a "clicker" style device. The CPS results are exported to Excel, Word, or

the CPS grade book. CPS provides instant feedback to teachers and students and increases the flow of student performance data for a clearer picture of student comprehension.

- **Timeliner 5.0**
TimeLiner 5.0 provides for the visual organization of challenging content and concepts in a chronological order.
- **Alice**
Alice is a tool for creating Pixar-style animated movies. It teaches problem solving skills that can be integrated into a variety of subject areas. This program was recently released for use by Carnegie Mellon University and Electronic Arts Inc. (EA) and is changing how computer programming is taught in the U.S. Instead of manipulating numbers and code, the Alice programming language lets students drag and drop 3-D characters - people, houses or animals - into scenes on the computer screen, move them around and tell stories as the student is learning the basics of programming. A great strength lies in making abstract concepts concrete in the eyes of first-time programmers.
- **Adobe Photoshop**
Adobe Photoshop is a [graphics editor](#) developed and published by [Adobe Systems](#). It is the current [market leader](#) for commercial [bitmap](#) and [image](#) manipulation, and, in addition to [Adobe Acrobat](#), is one of the most well-known pieces of software produced by Adobe Systems. It is considered the industry standard in most, if not all, jobs related to the use of visual elements.
- **Adobe Illustrator**
Adobe Illustrator is a [vector-based drawing program](#) developed and marketed by [Adobe Systems](#).
- **Microsoft Office XP Professional**
Used by staff and students, MS Office XP Professional is American Academy's office applications system and standard for word processing, spreadsheet, and presentation documents. In addition to the core Office XP programs - Microsoft Word, Excel, Outlook, and PowerPoint - Office XP Professional includes Microsoft Access 2002, the Office XP database solution that allows for storage, access, and data analysis.
- **Inspiration**
Inspiration Software, Inc. develops and publishes [visual learning](#) software for educators, students and business professionals. Inspirations encourages learning through visual representation by creating [graphic organizers](#)--such as [diagrams](#), webs and [concept maps](#)--to visually represent ideas and relationships. Research in both educational theory and cognitive psychology indicates that visual learning is among the very best methods for teaching students of all ages how to improve thinking skills, retention and writing.
- **Kidspiration**
The [visual learning](#) software tool Kidspiration is published by [Inspiration Software, Inc.](#) and is used primarily by students in kindergarten through 5th grade to build [graphic organizers](#) such as [concept maps](#), [diagrams](#) and webs. Students combine pictures, text and spoken words to represent thoughts and information. Kidspiration was developed to help younger students develop early literacy skills and more advanced students to improve comprehension skills and better organize ideas for writing.
- **KidPix**
Kid Pix is a [bitmap](#) drawing program created for young [children](#). The latest version of Kid Pix includes the ability to create slide shows and to incorporate animated elements into an otherwise static canvas.

- **Harmonic Vision Music Ace Maestro**
Music Maestro is a [software package](#) for [music](#) publishers created by Systems. It has a modular framework which allows its users to build a personalized system tailored to deal with their particular niche within the Music Publishing industry. Music Maestro gives users access to any related details, like publishers, rates and composers. For example, Music Maestro automates the song registration process, so users can provide societies with all the information they need much faster than was previously possible.
- **Yamaha Survival Kit CD for Yamaha Keyboards and Yamaha Portable Grand CD software**
Music applications
- **Writer's Companion**
Writer's Companion software allows students to organize concepts and ideas from the initial stages of writing through completion. Upon completion students can publish their work or export it to a word processor or page layout program.
- **Google Earth**
Google Earth is a free-of-charge, downloadable [virtual globe](#) program. It maps the entire earth by pasting images obtained from [satellite imagery](#), [aerial photography](#) and [GIS](#) over a 3D globe.
- **TestTaker**
Test Taker is the software for the Measures of Academic Progress (MAP). MAP is a series of tests that measure the student's general knowledge in reading, language usage, and math.

The following technology supports American Academy curricular materials:

- **Scott Foresman Science Games and MindPoint Quiz Show**
- **Scott Foresman ExamView Pro**

The following technology is application software:

- **Mozilla Firefox**
- **Internet Explorer**
- **Adobe Reader 7.0.8**
- **JAVA, Shockwave, Flash, DirectX**
- **QuickTime**
- **Real Player**
- **Windows Media Player**
- **Visio Viewer 2002 and 2003**
- **Grisoft Antivirus Software**

C. ISTE's Technology Standards for Students

Students today possess numerable information and communications skills. New technology standards have shifted from teaching children how to operate technological hardware and software to preparing them for how to use their now solid ITC skills in problem-based, authentic learning experiences. The new focus from teaching technology tools is to raising academic achievement and preparing students for highly skilled jobs in the digital age and global economy

Teaching the technology standards is a team effort. Classroom teachers work with their grade level teams; STEM Director, and other support personnel to discuss how and when the objectives will be incorporated into the lessons.

With permission from the International Society for Technology in Education (ISTE), American Academy will utilize the technology standards set forth and published by the ISTE. ISTE's National Educational Technology Standards NETS have served as a roadmap for improved teaching and learning by educators throughout the United States. The standards, used in every U.S. state and many countries, are credited with significantly influencing expectations for students and creating a target of excellence relating to technology.

In 2006, ISTE began work on the next generation of NETS for Students, which focuses more on skills and expertise and less on tools. Specifically, they address:

- Creativity and Innovation
- Communication and Collaboration
- Research and Information Fluency
- Critical Thinking, Problem Solving, and Decision Making
- Technology Operations and Concepts

The complete ISTE's Technology Standards for Students can be found by going to the following web link:

http://www.iste.org/Content/NavigationMenu/NETS/ForStudents/2007Standards/NETS_for_Students_2007_Standards.pdf