iOS One-To-One Report

Canyons School District
Education Technology Department

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iPad One-To-One Pilot • Sunrise Elementary • http://sunriseipads.blogspot.com/ • April 27, 2012

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Overview

iOS devices (iPad and iPod Touch) are versatile, all-in-one Internet capable computing devices. iOS devices are relatively easy to maintain, particularly with iOS5's built-in, wireless updates. They are user-friendly and intuitive for any age group or ability level.

iOS devices, particularly in a one-to-one environment, have the potential to save time and money because they reduce the need for many consumable items, paper-based products, and manipulatives. Additional technology devices like cameras, calculators, timers, GPS units, and mp3 players do not need to be purchased separately. Students, teachers, and administrators who have iOS devices have the tools and resources they need with them wherever they go.

In addition to the software included on each device, apps pertaining to virtually any topic quickly add functionality. With software updates and new apps being developed for iOS devices all the time, it is easy to keep on the cutting edge of technology and information without having to purchase new software packages or books. Software and apps evolve as new technologies and information become available. The creative capabilities, touch-screen interface, and multitude of subject matter resources on iOS devices make them engaging, motivating, and accessible for a wide range of learners.

iOS devices allow for on-the-spot, just-in-time, 24/7 learning. They are lightweight and portable, have a long battery life, and have built-in Wi-Fi capability. Students who use an iOS device to assist with their schooling are empowered to learn, research, and create whenever, wherever, and however they choose. iOS devices are innovative time management, data management, research, collaboration, communication, and creation devices for students, teachers, and administrators.

This report describes why iOS devices are effective one-to-one educational technology tools by citing ideas and examples of their use in the Canyons School District, particularly the one-to-one iPad pilot in Mrs. Laura Annen's third-grade class at Sunrise Elementary. It focuses on how iOS devices can be used to improve student engagement, improve specific skills, teach and learn in diverse ways, and change the current school culture and administrative process. Recommendations for device management and classroom management are also included.

How can iOS devices be used to…

IMPROVE STUDENT ENGAGEMENT?

"We created, we laughed, we learned, we thoroughly enjoyed putting some amazing [projects] together. Students were fully engaged, interested, and very excited to participate."
-Laura Annen, 3rd Grade Teacher, Sunrise Elementary

When students have an iOS Device in their hands, every bit of learning they do seems to become more enjoyable. Every activity engages students in the learning process, whether it be digital recreations of paper-based work, repetitive skill drills, innovative apps, games, research, or creative projects. When students enjoy the work they are doing it becomes easier for teachers to implement lessons at every learning level. The many tools available on iOS devices allow for a variety of ways to learn, represent, and present concepts. Students are engaged because they get to make choices and direct their own learning and because their instructors are able to teach in a variety of ways while quickly checking for student involvement and understanding.

Specific Ideas, Apps, and Engagement Examples:

Checking for Participation and Understanding

Writing Boards (CHALK BOARD, ScreenChomp, Whiteboard, Doodle Buddy, Penultimate)

These apps, and others like them, are helpful tools for engaging students and checking for understanding. Because every student has their own slate, every student has the opportunity to answer questions and solve problems, not just the students who have their hands raised. Students can quickly show their work to each other or to the teacher. While this concept is not new, the benefit of doing such work on an iOS device rather than a chalkboard or whiteboard is that answers and work can be easily saved (screen captured), submitted (printed, emailed, shared via bluetooth connection, or placed in Dropbox as a photo, depending on the app), or presented (plugged directly into the classroom projector).

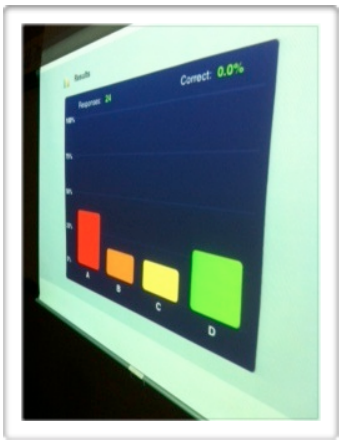
Mrs. Annen's third graders use the CHALK BOARD app to practice standard and expanded math notation. She said of this experience, "One of the intended learning outcomes for third-grade mathematics is to 'demonstrate a positive learning attitude toward mathematics.' I think today we accomplished that goal." She continued, "Can you say ENTHUSIASM? Can you say EXCITEMENT? Can you say it's as if math standard notation were the MOST SPECTACULAR subject in the whole world!"

Not every app has the same saving and exporting capabilities. Some are able to air print, email, share via bluetooth, or export to dropbox, while some are not. Every app, however, can at least be screen captured and shared from the devices's photo library.

Student Response (ABC - Magnetic Alphabet Lite, red:green, eClicker, eClicker Host, Socrative)

These apps turn any iOS device into a student response system. Some of the apps are simple. For example, red:green allows students to indicate their responses by turning their screen red

or green. A teacher can quickly poll the class on their opinion or true/false or yes/no questions. ABC - Magnetic Alphabet Lite allows students to drag letters onto their screens to display simple, one-word responses. Some of the apps are more complex. eClicker, for example, allows students to take polls, surveys, and tests on their devices while their teacher collects the data from their responses on his/her device. A teacher can use collected data to check for understanding or even to grade students.



Mrs. Annen's third graders used eClicker to find out more about the students in their class and to learn about graphing. Mrs. Annen was able to ask her students a series of questions and compile their responses in about 30 seconds. She was also able to monitor which students had completed their responses and which needed more time. They were then able to discuss the students' responses as a class as Mrs. Annen projected a graph representing their answers. Mrs. Annen was very excited about the the success of her lesson and said, "eClicker and eClicker Host are my new best friends!"

The eClicker Host app is a little expensive, however the host only needs to be purchased for the teacher iPad. The student app is free.

Student Participation (Stick Pick)

Stick Pick allows teachers to pull virtual sticks labeled with student names from a virtual can, ensuring class participation from every student. Because they are on the iOS device, names can be pulled without having to keep a can of actual sticks on a desk in constant danger of falling over and scattering everywhere. Stick Pick allows for multiple class lists on the same app, freeing teachers from needing to have a can of sticks for every class they teach. Mobility is another plus since teachers have access to all of their name sticks anywhere inside or outside the school building , including on field trips. Teachers can even record student responses and evaluate them based on Bloom's Taxonomy or ESL needs.

When Mrs. Annen uses Stick Pick she likes that it allows for interventions and continued checking for understanding with struggling students. She said, "...there was a way to reset the stick if I didn't think that that student had the concept completely down. I could click 'reset stick' and the stick would stay in the 'can' so that I could call on that student again with

another question on that same concept."

Some apps, like Stick Pick, are actually designed for the iPhone rather than the iPad. These apps can still run on an iPad by increasing the size to "2x" as indicated on the app screen. Occasionally the resolution on these apps isn't as high as it is on apps designed specifically for the iPad. However, this does not affect the usability of the apps.

Engaging Presentations

Interactive Whiteboard (Splashtop Whiteboard)

Splashtop Whiteboard transforms a teacher's iOS device into an interactive whiteboard. It allows the device to mirror the teacher's computer, turning it into a mobile controller for anything running on that computer. When the teacher computer is connected to a projector, students are able to see what the teacher sees. As the teacher moves freely around the room, he/she can have students interact with the lesson, website, application, manipulative, or document for all to see. Unlike most interactive whiteboard slates, Splashtop Whiteboard is easy for students and teachers to use because they can view everything being manipulated right on the screen of their iOS device.

There have been a few bugs with Splashtop Whiteboard. A handful of teachers have found that it does not always mirror correctly (it splits their screen in half) and they have to re-connect to fix it. This issue can almost always be resolved by keeping the iOS device in landscape mode and by setting the resolution of the iOS device to "iPad Best Fit" within the Splashtop Whiteboard settings.

Connection issues continue to be a problem for many teachers as well. These issues can usually be solved by trying the following:

1. Make sure the teacher computer and the iOS device both have strong Wi-Fi connections.
2. Make sure the Splashtop Streamer software that is installed on the teacher computer is up to date.
3. Check the IP address the iOS device is using to connect to the teacher computer in case it has changed. On computers that use DHCP to connect to the Wi-Fi signal, the IP address changes from time to time.
4. Make sure the security code on the iOS device matches the security code in the Splashtop Streamer software on the teacher computer.
5. Keep trying. It can sometimes take a few minutes and several tries for the iOS device to find the signal and connect properly.

Presentations (Keynote, Puppet Pals HD)

Teacher-directed class presentations are made easy using the Keynote app. Teachers can prepare multimedia presentations whenever and wherever on their mobile device. If done correctly, Keynote presentations can engage students and help them focus on key points in the curriculum. Better yet, allowing students to create their own presentations is a great way to help them synthesize information and share it with others in creative and succinct ways. Even giving a presentation is made easier with this app. When an iOS device is connected to a projector, the slide show is instantly ready to view with its own built-in laser pointer.

Puppet Pals HD is a great way to engage students in story-telling or sharing information. Students can record their voices while moving photos (puppets) across the screen. A variety of background images can enhance the shows. Imagine a student reciting the Gettysburg Address or explaining the scientific method using puppets!

Mrs. Annen's class used Puppet Pals HD to improve reading fluency. She said of the lesson, "We created, we laughed, we learned, we thoroughly enjoyed putting some amazing stories together. Students were fully engaged, interested, and very excited to participate."

Puppet Pals HD presentations can be exported to an iOS device's photo library. From there, they can be instantly published to YouTube, emailed, or uploaded to Dropbox. Keynote projects can be synced using iCloud, emailed, or sent to iTunes.

Keynote projects could previously be shared via iWork.com, however Apple will no longer be supporting iWork.com.

Rewarding Repetition

Drills (Math Drills Lite, Multiplication, My Spelling Test: Free, FlashCards ,Clock Pro, ABA Kindergarten.com, Fish School, FreeGrammar, Starfall ABCs, Formulas, Stack the States, Stack the Countries, USA Presidents, CountriesLE, Planets, music match)

This is just a small list of the many apps that allow teachers to prevent "Drill & Kill" activities from "killing" their students. Apps are available to help students master rote information in every subject area. Games and activities make it fun and engaging for students to learn needed information like vocabulary definitions, spelling rules, states and capitals, math and science formulas, foreign language vocabulary, music key signatures, and any other memorized facts.

Mrs. Annen described practicing spelling words with the iPad: "Repetition is good. Repetition is great! And repetition is SO much fun!"

Free apps, like those listed above, can possibly contain advertisements that are not appropriate for children. Some of these free apps can also be limited in capability and number of users. Theses issues can be resolved by purchasing paid apps instead of using the free versions.

Speech Tools (Talking Tom Cat, Teleprompt+, Dragon Dictation, Voice Memos)

Apps like these allow students to practice public speaking, reading and writing fluency, dictation, and proper speech patterns again and again in interesting and motivating ways. Talking Tom Cat, for example records what a student says and repeats it back to them in a funny voice, allowing them to hear their own words. They laugh a bit and then improve upon their work. Teleprompt+ allows students to input their writing, watch it scroll up their screen, and practice reading it at a steady pace. Dragon Dictation converts what a student says into text as long as the student speaks clearly, loudly, and slowly. Each of these apps provides unique ways for students to analyze and improve their own communication skills.

Some teachers find apps like Talking Tom Cat annoying and distracting for their students. Teacher preference would determine whether such an app would be used. Apps like Dragon Dictation are not always perfect in interpreting what has been said. Editing often needs to be done to ensure that messages being transcribed are accurate. Purchasing a microphone designed to plug into an iOS device may improve the accuracy of these apps.

Grammar/Word Choice (Mad Libs)

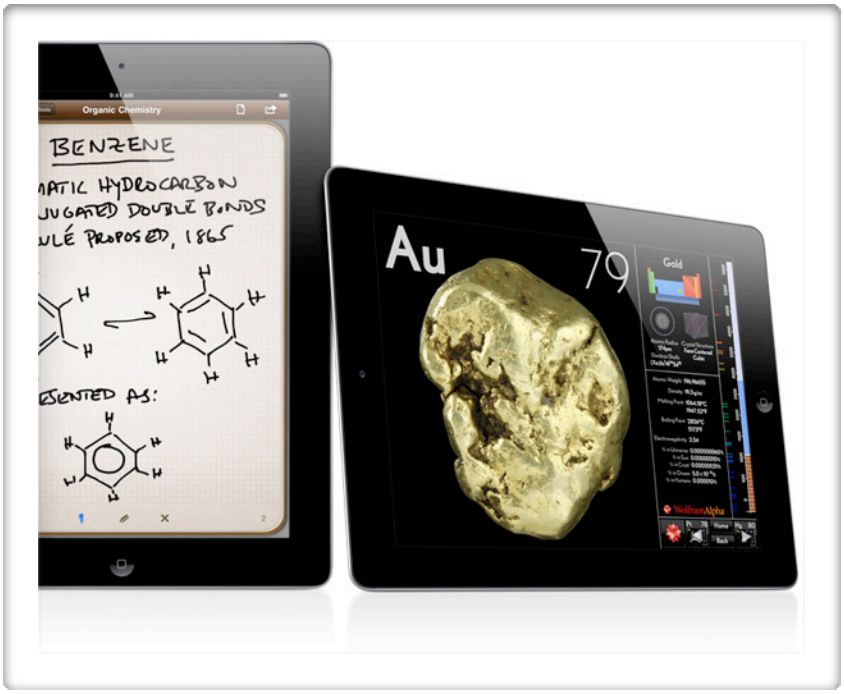
Mad Libs are a great way to get students interested in learning parts of speech and exploring word choice. The Mad Libs app has a particularly engaging interface and eliminates the need to purchase new MadLib books to write in. Students provide example after example of nouns, verbs, adjectives, and adverbs without ever getting bored because in the end they get to hear a silly story created from their words. These stories are not only hilarious, but they also provide a great way to engage students in analyzing words and how they fit into sentence structures.

When Mrs. Annen's third graders used the Mad Libs app she reported that it was, "… a great way to practice our parts of speech. We played a game… a Mad Lib. We entered nouns, adjectives, and verbs at the prompts into our class Mad Lib. Suddenly plain old English became hilarious! We learned that a good vacation place is one where you can ride lions or play Pokemon or go hunting for a movie theater. We also learned that somehow entering information electronically becomes more like a video game than a worksheet. And that sometimes using the iPads is like a good vacation from everyday traditional assignments. While we didn't really ride lions or play Pokemon, we very much enjoyed the experience!"

Only a few of the stories in the Mad Libs app are available for free. Additional stories need to be purchased.

How can iOS Devices be used to...

IMPROVE SPECIFIC SKILLS?



"iPad apps are expanding the learning experience both inside and outside the classroom. From interactive lessons to study aids to productivity tools, there's something for everyone."
-Apple Education

The ability for iOS devices to aid in the improvement of specific skills is limitless due to the huge number of apps available in every content area. Below are listed some examples of content-specific apps and examples of iOS devices being used in the classroom to improve skills. It is impossible to list every app available in every content area in this report, so following are several links to lists of student apps and how they tie into core curriculum goals and objectives:

- Kearns High School Student App List
- Escondido Union School District Student App List
- Provo School District Apps List
- apps4edu (UEN)
- Apple Education
- Canyons School District iOS Wiki

Specific Curriculum Areas, Apps, and Learning Examples:

General Information/Research

- Reference - Dictionary!, Thesaurus, Unit Conversion, Formulas, Atlas, Science Glossary, Periodic Table of Elements, iTranslate, IndieCommons, Discover (for Wikipedia), Wikipanion
- Research - Google, Safari, Pioneer Library
- Instructional videos/podcasts - YouTube, iTunes, Khan Academy
- General - Kid Genius, BrainPop, Alien Buddies, UEN, SchoolHD, Rover
- Curriculum Resources: CommonCore
- Assessment: BubbleSheet, LanSchool Teacher, A+ Pro, Socrative, eClicker

Mathematics

- Number Sense - Grover's Special, PearlDiver, LobsterDiver, Number Line, Park Math, Intro to Math by Montessorium, MathDesk
- Graphing/Data - Numbers, MathStudio, Diceshaker, 3D Coin Toss, Quick Graph
- Fractions - McGraw-Hill Fractions, Pearson Fractions, CandyFactory, Squeeze
- Operations - MathBoard, McGraw-Hill Divisibility, Multiplication, Kid Calc, Math Drills Lite, MRap 2x HD, Math Bingo, Rocket Ship, Calculator, iLive Math Animals of Africa, Basic Math, MathBoard
- Geometry - Fish School, Formulas, TanZen
- Time/Money - Toy Clock HD, Bright Ninja Tells Time, ClockTime, Time Money & Fractions, MakeChange, Count Money
- Advanced Math - iTrig Lite, Equation Genius, Math Ref, Khan Academy Calculus, Graphing Caluculator, Wolfram Alpha, Mathination, Mathemagics

Websites that require Flash do not work on the iPad, so students cannot directly access the tools available on Pearson SuccessNet, for example. Pearson is in the process of developing apps that will allow access to all lessons and eTools that are currently available on Pearson SuccessNet, and their representative has offered to allow Canyons District to try out the beta versions of these apps soon. Teachers can use their iPad to control any applications and websites that run on their laptops by using the Splashtop Whiteboard app.

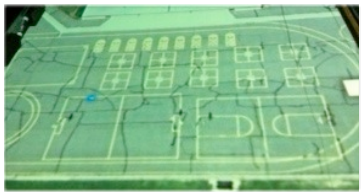
Science

- Astronomy - Planets, Stars, Cosmic, NASA, Sun N Moon, Star Walk, SolarWalk, Exoplanet, Orbit Architect, Planetary
- Natural/Earth/Physical Science - Google Earth, Saving Seeds, A Life Cycle App, QuakeWatch, RockHound, Sound Drop, Natural Science for Kids, TWC, KSL Weather, birdcountr
- Biology/Zoology/Physiology - Pocket Zoo, Animals, Muscle System Pro, D Bones, Nature Tap, Virtual Human Body, Colorado Wolf & Wildlife Center, Science360, Mitosis, Genetics, Molecules, iScience, VideoScience, VideoBiology
- Physics - Simple Physics, Bubble Ball, Cut the Rope, Angry Birds, Sky Burger, Monkey Flight, Newton's Cradle, Pretty Particles, Projectile, XpericaHD
- Ecology - Doodle Trash, Green City Index
- Chemistry - NMR Impurities, Elements, Elementals, Periodic Table, Science@VL

Social Sciences

- Current Events - CNN, USA TODAY, CNBC RT, Newsstand, ABC News, NPR
- Geography - Stack the States, Stack the Countries, GoogleEarth, Maps, MotionXGPS, Flat Stanley, Geography, Maps.com US History Atlas
- Civics - CountriesLE, USA.gov, Professor Garfield, 270toWin, Presidents by the Number
- History - Greek Mythology Lite, Oregon Trail, Shakespeare, ArtLite, Musée du Louvre, Library of Congress Virtual Tours, American History Time Line, History of Jazz, The Sixties, World History Atlas, Timeline Eons, United States Trivia, History 3D-Civil War, This Day in Music, This Day, Smithsonian.

Mrs. Annen's third graders used GoogleEarth to explore their community in relation to the world. Mrs. Annen describes their experience: "We talked about how we live in the world… on the continent of North America… in the country of the United States of America… in the state of Utah…. We found our city. We continued zooming in on the blue dot until we found the neighborhood surrounding our school. We continued until we found quite a great picture of the playground. We could see every hopscotch game, four square, and basketball court on the playground. That really made everything seem real!… Geography really came to life today with the iPads and Google Maps! We felt like we had the whole world in our hands!"



Language Arts

- Phonics - ABA Kindergarten.com, ABC Phonics, Starfall ABCs, Pocket Phonics, ABC Touch, Articulation Station
- Reading - iBooks, eReaders, Newsstand, ebooks (Morris Lessmore, The Magic of Reality, The Pedlar Woman of Gushing Cross, Milly & Molly Stories), JibJab Jr., Talking Tom Cat, Teleprompt +, Dragon Dictation, TypeDrawing, NOOK Kids
- Spelling - Magnetic ABC, CHALK BOARD, Ultimate Hangman, My Spelling Test: Free, Super Speller
- Vocabulary - ABA Kindergarten.com, Bluster, Woords, ShakerHD, Dictionary.com, Dictionary!
- Grammar - Mad Libs, FreeGrammar, English Gr5 Lite
- Writing - Total Recall, ComicLife, Puppet Pals HD, Talking Tom Cat, iMovie, GarageBand, StoryKit, TypeDrawing, Pages, In A World Drama, ComicLife, Telepromt+, CreativeBookBuilder, StoryLines, Demibooks Composer, This Is My Story (And I'm Sticking To It), CloudOn, Pigeon!

At Willow Canyon Elementary the second graders have a poetry jam each year. Last year they used their iPod Touch lab and the TypeDrawing app to create visual representations of the poems they read together. One poem was all about spring. Students selected phrases they thought were good examples of how poetry can "paint a picture with words." They typed their selected phrases into their iPods, then literally drew a colorful picture with the words. Poetic phrases scrolled around the screen in patterns creating flowers and sunshine.

Mrs. Annen's third graders regularly practice their no-excuse spelling words on their iPads: "We've been using our iPads to write our spelling words this year. We use 'Words Their Way' as our spelling program. We divide students up into groups according to their levels and let each group work on the skill that they need. We take the words and cut them apart and students then sort them into categories. Students are able to use the headers as the categories under which to sort the words. We've been using the CHALK BOARD app on the iPads to write the headers by hand and then write the words underneath them. It's another way to practice the words and keep the students engaged and excited about spelling."

There are so many apps that can be used in the writing process. Apps can assist students with mind mapping, brainstorming, creating flowcharts, essay organization, and storyboarding. Concepts like the 6 Traits of Writing, planning, composition, revision, editing, planning, beginning/middle/end, characterization, setting, and problem/resolution can all be practiced and mastered using these creative apps.

Mrs. Annen's class used Total Recall to plan ideas for stories they were writing: "Today we started work on the six traits of writing.... Since we are in the beginning stages of writing this year, we learned about the 'Ideas' trait. The good news is.....there's an app for that! We worked with 'Total Recall' this afternoon. This is a really neat app that allows one to organize ideas by creating colored bubbles on the iPad screen. The bubbles can be linked to each other to keep like topics together.... Sometimes we struggle with what to write about. This way, we can spend some time organizing ideas and when we finish writing one story, we will have another idea right at our fingertips.... One of the things that I liked most about this activity was that it allowed each student to be creative. That's exactly what we're trying to do in writing, be creative.... The students had fun being creative and learning to become better writers. It was 'app-solutely' amazing!"

Websites that require Flash do not work on the iPad, so students cannot directly access the tools available on Pearson SuccessNet, for example. Pearson is in the process of developing apps that will allow access to all lessons and eTools that are currently available on Pearson SuccessNet, and their representative has offered to allow Canyons District to try out the beta versions of these apps soon. Teachers can use their iPad to control any applications and websites that run on their laptops by using the Splashtop Whiteboard app.

Foreign Language

- Translation - iTranslate, GoogleTranslate, hello-hello world, hello-hello Spanish, hello-hello Chinese, any apps by hello-hello (French, Portuguese, Italian, Rusian, etc.)
- Spelling/Vocabulary/Writing - any of the above Language Arts apps

Visual and Performing Arts

- Music - GarageBand, iPitchPipe, Music Match, Notion, forScore, Tenuto, Bagpipes, Guitar, Bongos, FingerDrums, nTune: Violin, R-Tap Drums, Virtuoso, Xylophone, Shaker, Tambourine!, FingersTune (Ocarina), SingingFingers, Seuss Band, Miso Music, inReverse
- Photography - PS Express, Camera+, 8mmHD, PhotoBooth, Instagram, iMotionHD

- Art History - ArtLite, Musée du Louvre, Art Authority, coloruncovered, ArtHD, Art Periods HD, Draw, LiveSketch, PotteryHD, SketchBookX

Mrs. Annen's third graders have used their iPads as their instruments during music class: "We discovered today that in addition to all of the other functions of an iPad, it is also an awesome means of making music! The third grade fine arts core curriculum states, 'Students will play instruments as a means of musical expression.'... I hope the iPad counts as an instrument! We played 'Mary Had a Little Lamb' together today. It went very well!... We left the sound on, which we don't usually do when working with the iPads. That, of course, increased enthusiasm and student engagement.... Today was a little bit loud and exciting. Yes, we had quite the band going on!... The iPads were in fact music to our ears!"

There does not seem to be a way to easily send songs created in some apps (like GarageBand) to iTunes for use in other projects. The only way to do this is to hardwire the device to the managing computer and sync the music library. This is time consuming.

Physical Education

- Health/Fitness - Fitness Buddy HD, Workout Journal, Couch to 5K, Calorie Counter, Heart Rate
- Sports - Sports Rules, Bracket Maker

How can iOS devices be used to…

TEACH AND LEARN IN NEW AND DIVERSE WAYS?

"She's got the whole world in her hands!"
-Laura Annen, 3rd Grade Teacher, Sunrise Elementary

One of the greatest features of iOS devices is that they combine creativity and logic. One device offers organizational apps and reference materials right along with multimedia creation and editing apps. Students have a large variety of tools at their disposal, and they get to decide which to use and when and how to use them. This makes iOS devices ideal for diverse learners with a wide variety of needs and abilities. These devices allow students to be innovative, creative, and collaborative, and to share beyond the walls of the traditional classroom.

Specific Ideas, Apps, and Innovation Examples:

Creativity & Logic

Multimedia Tools (iMovie, Puppet Pals HD, In A World Drama, Photos, PS Express, GarageBand, Pages, ComicLife, Keynote, etc.)

Using iOS devices, students are able to quickly and easily create text, photos, movies, and music from a variety of apps and combine them into multimedia presentations that can teach and demonstrate learning in any genre. They allow students to plan, create, capture, edit, compile, and present all on the same device.

For example, groups of students can create short movies teaching math concepts learned throughout the year -- fractions, comparing numbers, shapes, long division -- and then present them to the class to help review for end of level testing.

Mrs. Annen's class used PuppetPals to create group stories. She used this project to get her students' creative juices flowing, but also to help them organize and refine their ideas, work on reading fluency, and practice presentation skills. She said of their activity, "Students came up a few at a time and got ready to add their parts to the story. They listened to the person in front of them and added on. They would talk into the iPad and move the characters at the same time. It was great! Our stories turned out so cute!"

Mind Map Tools (TotalRecall, iThoughtsHD, SimpleMind, Inspiration)

Mind mapping apps allow students to brainstorm ideas for stories, movies, and podcasts. They can also be used to tie together concepts from the core curriculum. Students can research information about a topic, then create a visual representation of their thoughts and connections. Any kind of graphic organizer is possible -- pro/con lists, compare/contrast lists, KWL charts, text-to-text/text-to-self/ text-to-world comparisons, and so on.

For example, a fourth grade class could create a "Pioneer Packing List", separating items into "wants" and "needs" to help them think about what it would have been like

to travel west in a wagon train. They could use iThoughtsHD to create a mind map of these lists and include pictures to go along with their ideas.

Mrs. Annen's class used TotalRecall to help them brainstorm writing ideas. She said, "We could use the right brain to create the 'idea' bubbles and the left brain to do the actual writing. This way we would end up using both halves of the brain. I think using the iPads is a productive way to get the creativity flowing as a prewriting activity."

The free version of TotalRecall only allows you to save two mind maps at a time. Saving more mind maps requires either deleting an old map or purchasing the paid app. Mind maps can be emailed as pdf files when they are completed, so deleting the old maps is not usually problematic. Also, TotalRecall does not have graphics to include in mind maps. Many other mind map apps do have graphics.

Differentiation

Leveled Learning (CHALK BOARD, My Spelling Test: Free, etc.)

Many apps allow students to participate in activities at their own level and at their own pace. They allow teachers to individualize instruction. These apps are available in any subject area and at any skill level.

Mrs. Annen assigns students spelling lists on three different levels each week based on their need for intervention or acceleration. Using My Spelling Test: Free, she is able to record the three different tests so students can take them all at the same time using their headphones. Students can test at their own level and at their own speed, repeating words as needed, and absent students are able to make up tests later. Students can see their scores instantly when the test is completed, and they can email their test results to their teacher.

Mrs. Annen says of My Spelling Test: Free, "[One] benefit of using this app is that the student can go at his own pace on the test. He can push a button to repeat a word if hearing the word one time wasn't enough. And so, we see that even taking a spelling test is better on an iPad!"

If a teacher wants to have various individualized spelling tests, they would either need to record each of those lists onto each iOS device individually or have the students record their own test for administration later. Recording their own tests could be great weekly practice for the students.

Leveled Apps (ABA Kindergarten.com, Starfall… English Gr5, Stack the States… Periodic Table of Elements, iTrig Lite… and everything in between!)

Apps for iOS devices are available for all levels of learners -- from Kindergarten, to upper grades, to secondary school, to administration. Apps are great tools for fast finishers and advanced students, offering them a variety of challenging activities and built-in ability to extend and expand on assignments. Apps are also great tools for struggling students, offering them remediation, intervention, and repetition.

Adaptive Apps & Settings (Dragon Dictation, VoiceOver, Zoom, Large Text, White onBlack, Speak Selection, Speak Auto-text, Mono Audio, Assistive Touch, Tripple-click Home, International Keyboards, etc.)

Many apps have been created to assist students with special needs. One example is Dragon Dictation. A student can dictate out loud what they would like to have in print, and Dragon Dictation will convert it into text for them. This app is very helpful for students who have physical or fine motor limitations. Speech teachers can use this app to help students practice articulation. In addition to the many apps available, iOS devices have built-in Accessibility options in the settings to help students with special needs like vision, hearing, and physical/motor disabilities (see the list in the

subheading above). There are also options for International keyboards to assist English Language Learners (ELLs) who need to compose in their first language or for students learning foreign languages. There is also an option to translate texting abbreviations into academic language!

Special Education Apps (Model Me Going Places, All About Me, augie AAC, Behavior Tracker Pro, ChoiceBoard Maker, Dance Party Zoo, FizzBrain, etc.)

Apps can be used to created hands-on, sensory-rich experiences for students with disabilities. For example, the Model Me Going Places app contains slide shows of children modeling appropriate behavior in various locations in the community to help prepare students for navigating these places themselves. All About Me is an app designed to help students learn important personal information like their name, phone number, address, and birthday. Dance Party Zoo helps children who need to practice motor skills, balance, coordination, and rhythm. Fizz Brain helps autistic children practice making eye contact.

Many more apps are available for students with a wide variety of physical and mental challenges. Here are links to some lists available online:

- Apple Special Education Site
- Special Education Apps in the iTunes App Store
- Autism Speaks
- iPhone, iPad, and iPod touch Apps for (Special) Education by Eric Sailers
- iPad Apps and Accessories for Special Needs by Eric Sailers
- iPad for Special Education by Christine Dowd
- No Limits 2 Learning - 14 Apps for AAC, Part One - 14 Apps for AAC, Part Two

Innovation

ebooks (iBooks, Newsstand, Kindle, B&N eReader, Iceberg Reader, ePub, electronic text books, Stories (Read Me), Morris Lessmore, JibJab Jr., The Pedlar Woman of Gushing Cross, Milly & Molly Stories, etc.)

Imagine having all your text books available any time you need them without having to run to your locker or lug around a 50-pound backpack! iOS devices have the potential to provide students just that. Not only are ebooks convenient, but they are also rich with multimedia, interactive material, weblinks, and built-in note-taking and marking tools. It is also possible for students and teachers to create their own books! eBooks range from official text books created by publishing companies, to ePub books created by teachers, to novels, to animated books, to picture books.

Collaboration Tools (Mail, Bump, Mover Lite, FlashCards, FaceTime, VoiceThread, Google Docs, Dropbox, Box.net, GoodReader)

iOS devices lend themselves to collaborative projects that are easily produced and shared in person or online. Synchronous collaboration is enhanced by apps like Bump, Mover Lite, and FlashCards that allow students to instantly share files between devices. Asynchronous collaboration is also a great benefit of using iOS devices. Tools like VoiceThread, Google Docs, Dropbox, Box.net, and GoodReader allow students to collaborate with peers at anytime from any place via shared documents and common resources.

Some websites used for data entry (like UtahWrite and GoogleDocs) do not run smoothly on iOS devices. GoogleDocs, for example, jumps around a lot as you try to enter data directly to online documents when accessed via Safari on an iOS device.

Apps that Access Outside Resources (FaceTime, Skype, Mail, Messages, Safari, YouTube)

Students and teachers benefit from the ability to access more information than can be kept in their minds and classrooms. iOS devices enable them to reach outside of the walls of the school, tapping into online information and contacting subject matter experts using Safari, FaceTime, Skype, and YouTube. These are also ideal tools for contacting other students from around the world to learn about their cultures, perspectives, and experiences.

How can iOS Devices be used to...

CHANGE THE CURRENT SCHOOL CULTURE AND ADMINISTRATIVE PROCESS?

"The iPads, once again, proved an invaluable tool in the classroom. We were able to learn and teach each other right in our own room... There was a wealth of knowledge just waiting to be explored and we were able to tap into it using the iPads." *-Laura Annen, 3rd Grade Teacher, Sunrise Elementary*

For the teacher or administrator, iOS devices are all about saving and connecting. iOS devices can help administrators and teachers save documents, save energy, save time, save resources, save money, save space, and even "save face". They can assist in connecting with students, faculty, parents, community, curriculum, and information. The ability to connect in new ways is what can ultimately create a change in school culture -- accessing and sharing information, thoughts, and ideas instantly and in any situation.

Specific Ideas, Apps, and Administration Examples:

Saving

Saving Documents (Mail, Bluetooth, screen capture, iCloud, gogoDocs, Dropbox, Box.net, QuickOffice)

Assignments that students have traditionally done on whiteboards, blackboards, and notepaper are lost when the board is erased or papers are thrown away. Completing these same assignments on an iOS device allows students to easily save work, notes, or ideas via email, screen capture, or saved documents.

Mrs. Annen's class has been enjoying submitting assignments electronically. A generic class gmail address has been set up on each of the student iPads. Because the students are not yet 13 years old, the students do not have their own addresses to receive mail, they only use the class address to be able to send mail to their teacher, principal, or parents: "…they were able to email their spelling lists to me. E-MAIL! E-MAIL! They were able to E-MAIL their assignments to me. It was SO amazing. They sent me their electronic, paperless spelling work in third grade."

There are a great variety of viewing, editing, and sharing capabilities within apps. Not all apps handle files the same way. For example:

For some apps, like iMovie, sending files via email is not an option. Files can be transferred between a computer and an iOS device via iTunes, but once they are sent to iTunes the iOS device must be hardwired to your computer to complete the transfer. This can be time consuming.

It used to be possible to save Pages projects to iWork.com, but that service is no longer being supported by Apple. Documents can be saved to iDisk instead, but a MobileMe account is required to manage iDisk, and those accounts can no longer be created.

Documents and data from Pages, Keynote, and Numbers can be backed up by iCloud, but users only get 5.0 GB for free. Other devices synced with iCloud will be able to see these documents. Signing in with an apple ID is required to use iCloud for document sharing. If using a group iCloud account, everyone in the group would be able to see everyone else's work.

Projects can be saved to WebDAV (Web-based Distributed Authoring and Versioning), but this requires an account with a WebDAV service which is not usually free.

Photos and videos from an iOS device's photo library can be uploaded to Dropbox, but not all apps have the same capability. Documents created in CloudOn can be saved to Dropbox. Files from Dropbox can be opened in other apps, but not in all apps.

Some apps, like iBooks, forScore, ReplayNote, and Whiteboard, are able to open pdf files. These apps can write over or draw on pdf documents, but can not actually edit the contents. The PDF Pen app can edit pdf files.

Some apps, like Pages, GoodReader, Mover Lite, and Evernote, can open Pages files. Some of these apps are able to fully edit the file (Pages), while others are only able to view the file (GoodReader, Evernote).

Saving Time and Energy (Data Dashboard, AIMSWeb, UtahWrite, UTips, Calendar, Contacts, Infinote, Clock, Calculator, Notes, FlashCards, Evernote, Penultimate, iTranslate, reference tools, Timer, Reminders, Discovr Apps)

iOS devices give educators greater ability to meet professional goals and improve teaching practices by helping them quickly progress monitor, administer assessments, access data, keep anecdotal records, and give student feedback. A variety of apps are designed to make communication with students, parents, and coworkers easy to do. Apps can assist teachers in administering timed tests, tracking student behavior, improving transitions, communicating with patrons who do not speak English, and even finding other apps. Students can use these tools to more easily check their own progress, predict their grades, complete online courses, and keep track of assignments.

Mrs. Annen uses the Timer app in her class to help monitor the time students spend out of the classroom on bathroom and drink breaks. When a student leaves the classroom, he/she sets the timer on his/her iPad. This helps Mrs. Annen monitor students who like to waste time in the halls. She also uses Timer and Reminders to help students with work completion problems and to help students know when to attend speech, resource, and reading intervention groups. She says, "…some of these ideas might not seem like instructional uses of the iPads, but any time one can increase the amount of time that a student is in the classroom ready to be instructed, there is definitely a better chance of being instructed!"

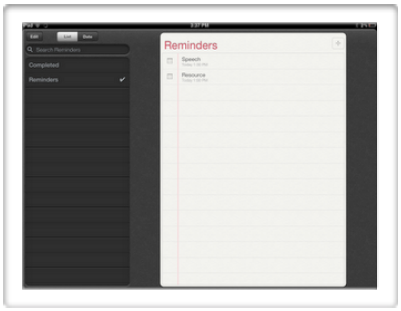
Saving Money, Resources, and Space (Splashtop Whiteboard, Camera, Dictionary!, ebooks, iHandy Level, ATTScanner, RedLaser, MotionXGPS, QRMaker, Compass, Flashlight, Timer, eClicker, Stick Pick, Mad Libs, DiceShaker, CandyFactory, TanZen)

With an all-in-one iOS device it is easy to save money and free up storage space. For example, a school might spend thousands of dollars to supply one teacher with an interactive whiteboard, a wireless mouse or slate, a document camera, a digital camera, a video camera, a dictionary, a text book, a student response system, and any number of other tools. For approximately $600 (including accessories and apps) a teacher can have the functionality of all these tools, and more, in one small device.

In addition to saving space and money on all the equipment previously needed, many consumable resources like dice, notebooks, play money, counters, and other math manipulatives do not need to be purchased when students have apps that simulate these items.

Money and space can also be saved when students use electronic text books and complete online courses using iOS devices. Teachers can create their own text books or online courses that tie directly into the core curriculum and include the specific information and resources they use in their classes. Or, durable and updatable ebooks, apps, and online content created by publishing companies like McGraw-Hill and Pearson can be adopted.

"Saving Face" (Mail, Contacts, Calendar, Timer, Clock, Reminders, Notes, Infinote, Dropbox, Photo, SeatCharter)



iOS devices can help busy, overwhelmed educators and students remember important things like meetings, appointments, schedules, special events, birthdays, due dates, resource classes, and anything else they forget to do each day. Administrators can quickly access school maps, bell schedules, and bus routes stored in Dropbox. Teachers can create their own class facebook or electronic seating chart using Photo or SeatCharter. The days of being the only one who forgot the faculty meeting , the boss's birthday, or the name of the student in the back of the class could be gone (or at least decreased) forever!

Connecting

Connecting with Students (Stick Pick, Peek, Splashtop Whiteboard, Keynote)

iOS devices are great for demonstrating and sharing ideas, creations, and information in the classroom. VGA adapters and the Apple TV, make projection from iOS devices easy and untethered. For example, anything a computer can do can be mirrored and manipulated by teachers and their students on the iPad using Splashtop Whiteboard. Keynote makes lectures and presentations easy to create, display, and control. Peek allows a teacher to show one portion of a page at a time when presenting.

Mrs. Annen projects her iPad often for a variety of class projects. For example, she projects her Virtuoso piano keyboard during music class: "We played 'Mary Had a Little Lamb' together today.... I used my iPad with an adapter and projected it up onto the screen. I then played the song on my iPad while students watched the keys played on the screen and listened to the tune. Students then tried to repeat what I had just played."

She projected the results of a survey the students took using eClicker: "We also set up an iPad in front and connected it with the projector so that we could also see both the questions and the bar graphs on a large projected screen in front of the class. It was so intriguing to see the information come up looking so bright and colorful in front of the class."

She often projects her timer: "I can set the timer on my iPad and project the image up on the big screen. That way when we are taking a math timed test, students can look up at the board and see how many seconds are left to take their test."

Connecting with Faculty/Personal Learning Networks (Mail, Messages, FaceTime, Google Docs, screen capture, Twitter, TweetDeck, Facebook, YouTube, foursquare, Zite, iTunes, Flipboard, Skype, Meetup, Savenger)

iOS devices can assist in professional development, collaboration, and feedback. Google Docs can be used on an iOS device to share documents, collaborate on meeting agendas, and to record helpful data. For example, many principals in the Canyons District have created observation forms in Google Docs and added quick links to them on the home screens of their iOS devices. They use these forms to record student behavior, teacher observations, and even mileage.

At Sunrise Elementary, Principal Frank Schofield uses a Google form to give quick feedback during all his classroom visits using criteria set by the Building Leadership Team. Before submitting a completed observation (so that the data can be complied on Google Docs) he takes a screen capture of the form on

his iPad and emails the image to the teacher he observed with helpful comments, suggestions, and compliments.

Many apps are also available to help educators connect with others in their field. For example, Twitter hashtags like #edapp and #edchat help educators share ideas and ask questions. Zite is great app for gathering articles from educational blogs, wikis, and online journals. Educators can keep up to date with the great accomplishments made by Canyons District teachers and students by following @canyonsdistrict on the TweetDeck app. The latest episodes of iTunes podcasts can be automatically downloaded to an iOS device, ready to be listened to.

Connecting with Parents and Community (Email, Facebook, Twitter, Google Cal, school website, YouTube, Skype, FaceTime)

Communication with parents and the community about school events, successes, needs, concerns, and celebrations is made much easier using an iOS device. Not only can faculty access communication tools instantly wherever they are, but they can also quickly publish projects and information to websites and social media networks. Frank Schofield, principal at Sunrise Elementary, uses his iPad to post frequent updates to Facebook and Twitter. He often adds links to student-created multimedia projects that have been posted to the school YouTube channel and posts links to his principal blog where he writes entries spotlighting the excellent teachers on his faculty.

Connecting with Curriculum (multimedia tools, Discovr Apps, anything!)

Cross-curricular connections naturally and seamlessly occur using iOS devices in the classroom. Because so many tools, documents, books, apps, and assignments are all on one device, it is easy to use resources in multiple classes. Every app available is complimented by others, allowing students to quickly make text-to-text or class-to-class or app-to-app connections. For example, a photography class could take photos and create campaign posters for a mock election using PS Express and Comic Life. The drama club could then use iMovie to film campaign debates and speeches. A social studies class could use eClicker to compile the results of the mock election. Then a math class could create a graph of the results using Numbers. So many different disciplines connecting together using one device!

Connecting with Data (Computer-Based Testing and Assessment)

With more and more of our educational assessments and progress monitoring done on computers, it is beneficial to have one-to-one devices that are capable of being used as assessment devices. While state testing is not currently available on iOS devices, many of the Common Formative Assessments (CFAs) that students take are. Also, all achievement coaches and reading assistants in Canyons District elementary schools currently use iPads for progress monitoring and tracking student achievement data.

Mrs. Annen's class recently used their iPads to complete their math CFA: "We actually took the CFA as a class in the computer lab, but a few students were unable to finish, and at least one was absent. So, rather than schedule the whole class for an extra time in the computer lab, we just pulled a small group over to our back table, reminded them of how to log in, and let them work.... it is SOOOO convenient to be able to take the CFA math assessment in our classroom."

Many computer-based tests are not available on iOS devices at this time. For example, CRTs and the Direct Writing Assessment (DWA) cannot currently be taken on iOS devices.

Connecting with Information (Safari, Google, USA.gov, UEN, Pioneer Library, etc.)

iOS devices give students access to the benefits of the Internet quickly, easily, and constantly. Research skills, decision making, problem solving, and synthesizing information are necessities with this kind of access and must be an integral part of every class and every curriculum. Students can learn to recognize good, reliable sources of information, check the accuracy of their research, and cite sources -- all things needed in an anyone-can-publish-anything, Internet-based world. Eventually, these skills can become second nature and inherent in all that students do. Students can develop into the kind of people who seek and analyze information and think in innovative ways, creating a new culture of researching, learning, creating and sharing in our schools.

Integration of the Apple TV and Reflection App in the iOS Environment

"The number of students that we could accommodate in sharing their creations in a short amount of time skyrocketed. It was incredible!" -Laura Annen, 3rd Grade Teacher, Sunrise Elementary

Once students and teachers realize how convenient using a portable iOS device is, they do not want to give up their new-found freedom. It is frustrating, then, to have to be tied to the front of the classroom whenever presentations and demonstrations are given. Proximity to students, mobility, and ease of projection are important for iOS use in the classroom. As mentioned, the Splashtop Whiteboard app is a helpful tool for mirroring and controlling lessons and presentations run on a laptop or desktop computer, but this still does not allow for mobility when projecting apps and projects stored on an iOS device itself. The Apple TV and Reflection app allow for this mobility and wireless freedom. They allow an iOS device to be used as an easily portable, wireless computer and document camera. Following is a description of how these two wireless presentation options function.

The Apple TV:

The Device

The AppleTV is a device just a little larger than a hockey puck. In fact, it looks very much like a hockey puck except it is square instead of round. It is primarily designed as a wireless device, although it can be wired as well. The device utilizes an HDMI port for output to HD TVs or projectors. This potentially limits the use in schools where HDMI projectors have not been adopted in any quantity yet. To use the Apple TV with a VGA projector requires the use of an HDMI to VGA converter box and an HDMI cable. This setup allows the use of the AppleTV with nearly all projectors.

Content

The AppleTV can receive and display media from a variety of sources. Some of the services that can be used through the AppleTV include: iTunes content, both audio and video, Netflix, MLB TV, NBA TV, YouTube, The Wall Street Journal, and others. You can also access content from your desktop or laptop computer. You could, for example, download videos from eMedia (a UEN/Pioneer Library digital video resource) and play those through the AppleTV via your computer.

iOS Use with AppleTV

The first generation iPad had limited video out capabilities. The were only a few video driven apps that could display to a projector via the Apple VGA Adapter. With the introduction of the iPad 2 and iOS 5 came a new technology called AirPlay. AirPlay allows the output of virtually any content from an iPad 2 or newer to be wirelessly projected through the AppleTV. The iPad needs no longer be tethered to the projector via a VGA cable. The advantage of the AppleTV setup up is that it permits the iPad to be used anywhere in the room, for example, handed to a student for them to demonstrate knowledge. The contents of the iPad can be mirrored to the projector, so a teacher can demonstrate work and even use the iPad as a document camera.

Technical Setup

The setup of the AppleTV is fairly simple. This setup needs to occur where there is availability of the VGA cable connected to the projector in the room. First, the AppleTV and VGA to HDMI converter need to be plugged into outlets. They also need to be connected together via an HDMI cable. Then the converter box needs to be plugged into the VGA cable that connects to the projector. At this point the AppleTV is ready to be configured. It needs to be connected to the wireless network. Then any updates that are available should be run on the device. Once that is accomplished, all that remains is to go to the iPad, double-click the home button to access the app tray at the bottom of the screen, then select the AirPlay button, choose the device to project to from the menu, and turn on mirroring. At that point the projector will show the iPad screen. Until turned off, whatever is being done on the iPad will show on the projector.

Once this setup is complete, any iPad on the same network can be accessed to display through the AppleTV. If you had a class set of iPads, each of the iPads could be displayed easily, however, only one at a time can be displayed.

Cost

The cost of the entire setup for projecting wirelessly from the iPad is just under $150. The parts list is as follows:

- AppleTV - Order from apple.com. Part #MD199LL/A $99.00
- HDMI-VGA + Audio converter box - Order from wowparts.com. Part #12730 $39.99
- HDMI cable 1.5' - Order from Monoprice.com. Part #3872 $$1.97



Reflection App

The Reflection App accomplishes much of the same functionality of the AppleTV setup. It is an application that mirrors the iPad to an Apple computer display. The cost of the app is $15.00 and can only be ordered at this time from the developer at ReflectionApp.com.

While this seems like a much less expensive route for accomplishing what the AppleTV setup does at ten times the price, there are some caveats. Since this solution is software based, Apple could at anytime change their code and make the app inoperable. This app comes from a single developer working out of his home, so support could be limited as well. The app, in our limited testing, seems to work well, although there are daily reports on the web of users having various issues with it. Still, for the price and the ease of use it is a viable option at this time.

Recommendations for Device Management

"Knowing we will get to use [the iPads] soon is probably the best motivator to learn rules I have ever seen." -Laura Annen, 3rd Grade Teacher, Sunrise Elementary

There are many things to consider in managing iOS devices, particularly when there are large numbers of devices being deployed. Management of devices will vary slightly depending on the age group and whether or not students will be taking the devices home. We can learn a lot from other pilot programs as well as our own. For example, Kerns High School in the Granite School District has deployed an iPod touch to each of their students. Information about how they have managed their iPods can be found on their wiki, The iSchool Initiative. Following is an outline of management recommendations based on experiences with iPods and iPads in the Canyons School District.

Management Ideas and Recommendations:

Initial Purchases

When an iOS device is first purchased, make sure the following are included in the purchase:

- 16 GB iPad2 or later (Many people prefer iPads to iPods because of the larger screen, however some have found the "pocketability" of the iPods to be beneficial.)
- Smart Cover
- Screen cleaning cloth
- USB cable
- USB power adapter
- Engraving - the school and district names (free if included on the order)

The following should be included with student devices:

- Bretford PowerSync cart
- Headphones
- Optional insurance plan if students will be taking devices home

The following should be included with teacher/administrator devices:

- VGA adapter
- Screen Protector

The following are nice accessories, but not mandatory:

- HDMI adapter
- Wireless Keyboard
- Apple TV for AirPlay
- Padded carrying case
- Stylus
- 6-foot power cord
- Camera connection kit
- In-ear headphones with remote and mic

Initial Setup

- Label each device and its accessories with some kind of ID number or name.
  - Devices in student labs can be numbered 101-130, 201-230, and so on.
  - Devices to be kept by individuals can be labeled with their name and/or district asset number.

- Designate one main computer that will always be available to set up all devices using school iTunes accounts.
  - Apps are stored on this computer as well as on iCloud.
  - Use this computer for backups and to restore devices.
  - Consider setting up different iTunes accounts for different grades or for teachers/students so that it is easy for groups to wirelessly access only the apps purchased and licensed for them.
- Set up student devices using the iOS management software.
  - Remove the Apps store and iTunes stores if desired (depends on whether or not students will be allowed to add their own account to the device).
  - Configure email settings.
  - Set up iCloud.
  - Purchase and organize apps and folders so students' screens look the same and it is easier to find apps.
  - Set up Dropbox and other apps that require access to a school or class account.
  - Bookmark useful and important sites in Safari.
  - Add frequently used websites to the home screen.

Management

- All required paid apps will be purchased using the Volume App Purchasing Program. At the start of the year/term, devices can be cleared and synced by restoring from backup. This will delete and replace anything on that device, but it is much more time efficient when resetting the starting image.
- After initial setup, run all updates wirelessly.
  - Option 1 - The teacher managing the devices logs on to the Apps store on each device and downloads apps and software updates from the cloud, then logs back out.
  - Option 2 - The teacher managing the devices gives all users a temporary password and instructs them to log on to the Apps store to download apps and software updates from the cloud.
  - Option 3 - The teacher managing student devices downloads all updates on the designated computer, connects it to the USB cable on the cart, and plugs all devices into the cart so apps are synced simultaneously. Software updates can be run through the cart as well, but have to be done one at a time. This is more effective if separate student/teacher accounts exist. If there is only one account, the "sync new apps automatically" option must be deactivated to avoid loading unlicensed teacher apps onto the student iPads, which means that each new student app must be manually checked for each iPad in order for them to be loaded. This is very time consuming.

- Older students, teachers, and administrators can add their own account wirelessly in addition to the school account. Teachers and administrators should set up their own iCloud account using their own AppleID before any school accounts are added.
- Use the cart to update apps and to charge student devices. Even with cart, iOS updates and restores from backup still have to be done one device at a time
    - If students are taking devices home the cart might only be used at the start/end of term.

Care and Use

The following will help prolong the life of iOS devices:

- Wash your hands before use.
- No gum, food, candy, drinks near equipment
- Be gentle with equipment - computers, devices, cables, adapters, carts, headphones, etc.
- Walk, and carry your device with two hands.
- Don't drop equipment or place it where it might fall.
- Protect your device, don't just shove it in your desk or backpack.
- Don't leave devices in your pockets.
- Don't leave equipment in a car.
- Clean devices using only approved cleaning supplies.
- Keep the cart clean - it is not a trash can or craft table.
- Keep the cart locked when devices are being stored inside.
- Keep the cart plugged in.
- Do not remove plugs from the cart.

The following is a list of basic iOS skills that should be taught in initial user training:

- Using the cables and adapters
- How to turn the device on
- How to turn the device off - don't need to turn off often
- How to restart a frozen device
- Putting the device to sleep and waking it up
- Volume
- The home button - single click, double click
- Search
- Swiping, tapping, double tapping, pinching, zooming, turning, two fingers, one finger
- Settings

- The 1X and 2X button when iPod apps are being used on iPads
- Creating and managing app folders
- How to use the Smart Cover
- How to connect to the Internet
- Adding websites to your home screen
- Printing, saving, and emailing

The following are suggestions for iOS device management, particularly in elementary classrooms where devices are not being taken home:

- Students always use their assigned number.
- Students wait to be called to get their device and to return it.
- If devices are being kept in a cart, the teacher can unplug them all before students retrieve them and can plug them back in at the end to save time.
- "Hands off" is a good signal for students to stop what they are doing and listen to teacher instructions.
- Flashing the lights on and off is a good signal for students to remove headphones and give the teacher their attention.
- The colors of students' Smart Covers can be an easy way to form collaborative groups.
- Students inform the teacher if a device is not working properly so he/she can put in a help request.
- Teachers count to make sure all devices are returned after every use.

Data Storage

- Class Dropbox, email, and GoogleDocs accounts can be created to help with sharing and storing data and turning in assignments. Students turning in assignments via the class email account need to clearly title email messages so the teacher knows from whom it was sent. Use group accounts rather than individual accounts for children under 13. Allow students under 13 to send email but not receive their own email. Anything placed into a class Dropbox or GoogleDocs account is vulnerable to being edited, deleted, or viewed by others. A hard sync and backup would need to be done on a regular basis to ensure safety of student projects and to export multimedia projects.
- Individual student email, Dropbox, GoogleDocs, and iCloud accounts make it possible for students to send and receive their own messages, easily turn in work to their teachers, save projects to their own storage folders without it being accessed by other students, and to back up the contents of

their devices wirelessly. This is recommended, however individual accounts are not allowed for students under the age of 13.

Recommended Apps

Every student device should have at least the following apps in addition to apps for specific curriculum areas:

- Apps included at purchase - Calendar, Contacts, Notes, Maps, Videos, YouTube, FaceTime, Camera, Photo Booth, Settings, Reminders, Newsstand, Safari, Mail, PhotosMessages, Music
- Clock
- Timer
- Calculator Pro (Free)
- Skype
- Dropbox (or Box.net)
- Document reader (ie. gogoDocs or GoodReader)
- Printing app - the Canyons District IT Department is currently working on finding the best printing solution for iOS5
- Whiteboard (ie. Whiteboard, ScreenChomp, or CHALK BOARD)
- iWork (Pages, Keynote, Numbers)
- CloudOn
- Multimedia tools (iMovie, GarageBand, Comic Life, PuppetPals HD)
- Google (Google, Google Earth, Google Translate)
- News (ie. ABC4.com, fox13now, CNBC RT, CNN, USA TODAY)
- Flash cards (ie. gFlash+)
- Weather (ie. TWC)
- Dictionary!
- eReader (ie. iBooks, Kindle, B&N eReader)
- Information sharing (ie. Bump or Mover)
- eClicker
- Mind mapper (ie. Total Recall, SimpleMind+, or iThoughtsHD)
- Dragon Dictation

Every teacher/admin device should have at least the following apps in addition to the student apps listed above and apps for specific curriculum areas:

- iTunes
- Apps Store
- Twitter (or TweetDeck)
- Facebook
- Zite
- Splashtop Whiteboard
- Stick Pick
- eClicker Host
- Peek

Current Management Issues to be Resolved

Following are some iOS management issues that the Canyons District IT deployment team are working on:

- The smart cover acts as a convenient stand, but unfortunately is angled so that the overhead lights reflect on the screen. Because of the glare, you can't see anything unless you change the angle of the iPad or lean over the iPad.
- Keyboarding on an iPad is not as efficient as using a regular keyboard. It would be a more effective tool for writing/composition if each user had a bluetooth keyboard to connect to. This is even more true of an iPod touch.
- Initial setup of iOS devices is very time consuming as each device needs to be set up one at a time. However, there is a new version of the iOS management software that will hopefully be more effective in speeding up this process.
- There is a possibility of tying iOS devices to AD/OD accounts so students can back up and save projects to existing "My Documents" folders instead of relying on class Dropbox accounts. The Canyons District IT Department is investigating the possibility of binding iOS devices.
- There is an easy way to print from iOS devices that no longer works with iOS 5. It is not impossible to print, but an app for printing needs to be installed and the number of printers enabled can cause problems. The Canyons District IT Department is currently working on a solution for easy iOS printing.
- It has taken a long time to update iOS software or restore an iOS device from a backup because previously this could only be done one device at a time, however this has been made much easier now that iOS5 allows wireless software updates. Students are now able to download and install software on their own devices.

1:1 Considerations

Following are some pros and cons of various 1:1 scenarios using iOS devices.

One-to-One or Not One-to-One?

The Canyons District has conducted iOS some pilots in which devices were used one-to-one and some in which a cart of devices has been shared school-wide or by specific grade levels. Greater success has been seen with the one-to-one pilots.

One-to-One:

- Not having to share devices means students can save their own work on their devices and not worry about others deleting their projects. This gives them more time to complete in-depth projects without worrying that those projects will be altered or gone when they return to work on them again. Students can also set preferences and setting to suit them that will not be altered by others.
- Students can have their devices with them in every subject, all day, allowing them to fully integrate its use into every aspect and content area of their learning.
- Having one-to-one devices saves time otherwise needed to constantly save or share files and distribute and collect devices throughout the day.
- Students take individual responsibility for the care and maintenance of their devices instead of assuming someone else will clean and take care of them.
- Students have access to their device any time, rather than having to wait for other classes to be finished with the devices.

One-to-One:

- Getting one device for every student is expensive.
- It needs to be decided whether or not one-to-one devices will stay with students as they move on to the next grade. If yes, then it becomes even more expensive to keep up a one-to-one initiative going. If no, then all the skills students have learned and all the access they have become accustomed to will be lost after their year of one-to-one access.
- If student devices break or are lost, they will have problems keeping up with their work until they are fixed. This requires a plan for fixing devices and determining who is responsible for repairing or replacing them. Some schools have set up a device "hospital" where students can borrow an extra device until theirs is repaired. This would be even more effective if student accounts were bound to Active Directory so students could immediately access all their projects on a loaner device. This would, however, mean purchasing extra devices to have on hand. Some schools have offered students the option to purchase insurance for their devices so that they can be replaced

without charge if they are ever broken or stolen. Canyons District iOS pilots have not had much trouble with broken devices so far.

Take-Home or Not Take-Home?

So far Canyons District has not sent home iOS devices with students in any of their pilot programs. There are pros and cons to allowing students to take their devices home, but a program that allowed students to take devices home would be greatly beneficial.

 Take-Home:

- Students would be able to take home and continue working on projects that they start at school.
- Students would be able to use the Calendar app, Memos, Reminders, and other planner and homework tracking apps to help them stay organized and remember due dates and responsibilities.
- The need for text books and paper handouts would decrease since students would be able to access online resources and eBooks on their devices at home as well as at school.
- Students would become even more proficient in using their devices and the resources on it because they would become their main connection to all of their coursework.

 Take-Home:

- The possibility of devices breaking or being lost or stolen increases when they are taken home.
- The District would not be able to filter content that students access on their device via home WiFi networks.
- If a family does not have WiFi access in their home, their student would be limited in the access their device has unless they find a free network elsewhere, like at a public library, restaurant, or coffee house. However, many of the apps on their device would still function without WiFi.

Why iOS Devices?

There are a lot of possible devices that can provide one-to-one access for students. Following are pros and cons for several possible devices:

 iOS Devices:

- Portability, light-weight

- Ease of use
- Availability of apps, many of which are free, constantly updated, new content areas, any subject area
- Cheaper than a full laptop
- Cheaper and more accessible than text books
- All-in-one device
- Easy setup, have been virtually issue-free in pilots
- Attractive to students - they like working on the devices
- Intuitive
- Easy to update and manage once iOS 5 is installed
- Communication tools - Facetime - virtual office hours
- 3-D models - even more effective than on a MacBook because of the ease of manipulating the images
- Easy use of surveys
- Accessories
- Compatibility with software already installed in many school creativity and mobile labs

iOS Devices:

- No flash (however, developers like Pearson are building apps instead of using Flash)
- Some web-based applications are still not as user-friendly, ie. UtahWrite and Open Class
- Can't load some meatier software programs
- Have to purchase a separate wireless keyboard for a full keyboard experience
- Managing iTunes and VPP accounts takes time
- More easily lost or stolen than desktop devices

Netbooks:

- Regular keyboard
- Strong, durable
- Less money than iOS devices
- Easy to bind to Active Directory
- Windows operating system for those who prefer it

Netbooks:

- Many more management, software, and hardware issues
- Pilots have experienced issues with sound, stylus, software, hardware, carts, etc.

- Require more tech support
- IT Department has to manage software installed, rather than school-based management
- Small memory sometime limits software that can be installed
- In an elementary school, Windows platform is different than the Mac platform in their creativity and mobile labs - compatibility issues and learning curve for users
- Require more Ed Tech support and professional development in schools that are primarily Mac-based

MacBooks:

- Can run full software packages
- More memory/processing power
- Easier to type on - regular keyboard
- Regular sized screen, keyboard, mouse
- Dual platform availability, ie. VM Ware or Boot Camp
- Same machines as those located in most creativity and mobile labs, particularly in elementary schools
- More virus-immune than Windows machines

MacBooks:

- More expensive
- Heavier, bulkier - less portability than iOS or other hand-held devices
- Require more tech support than iOS devices

Thin Client:

- Login using AD/OD
- Less Expensive
- Can be managed en mass - updates can be pushed out to all computers in the District at the same time
- Not easily stolen
- Can be replaced and updated for less money

Thin Client:

- No portability - Students can't take their device with them from class to class or home
- Takes up a larger space in your classroom

- Windows operating system - not as known in the elementary schools
- Technical/login issues - students and teachers are sometimes unable to access their accounts

 Android Devices:

- Less expensive

 Android Devices:

- Less availability to apps
- Not compatible with Mac computers and creativity and mobile Mac labs

Recommendations for Student Behavior and Classroom Management

"...great power involves great responsibility."
-President Franklin Delano Roosevelt

In many ways classroom management does not change with the use of iOS devices. In fact, increased student engagement from the effective use of iOS devices in the classroom may decrease behavior problems that occur due to student non-participation. However, because iOS devices allow increased access to people, information, and activities, there is the possibility of them becoming a problem or a distraction. If teachers and administrators prepare well and set clear expectations for student behavior, any possible problems that could arise from the use of iOS devices can be minimized. Anyone can find ways to misuse any tool -- even a pencil -- if they really want to be disruptive, but students can be taught to be responsible with the increased power their one-to-one devices give them.

Classroom Management:

Transitions & Procedures

As with any new task or tool, teachers need to carefully consider the impact iOS devices will have on their classroom routines. They will need to train their students well on iOS procedures.

- Teachers need to create clear instructions for:
  - using equipment (iOS devices, headphones, keyboards, etc.)
  - caring for and protecting equipment
  - storing and retrieving devices from carts
  - making sure devices are charged and ready for use in every class
  - turning in assignments
- Teachers may find that at the beginning of the year these procedures take a little more time for their students to complete. However, as with any routine, if teachers take the time at the start of the year/term to practice with their students, they will quickly see improvement.
- Teachers need to consider the ideal physical arrangements for using iOS devices. Seating arrangements should reflect the kind of work students will be doing. For example, if students are recording a lecture or taking notes, they should be seated facing their teacher. If students will be collaborating, they should be seated in groups to allow for discussion and team work. If students are being asked to capture audio or video, arrangements need to be made for quiet places to record. Some teachers have tried creating sound booths out of boxes, folders, or books, some have had students record one at a time while others work silently, some have had students go into the halls to record, and some have had parent volunteers work with students in separate recording rooms.

Mrs. Annen has explored some of these routines with her students. Talking about practicing iPad procedures she says, “We made some organizational progress.... It was a little bit tricky to be sure that each student put his iPad back in the correctly numbered slot, but we are definitely making progress. We are getting quicker at the transitions!”

Talking about recording she says, “The project is going well, but gets slowed down a little bit when it comes to recording. It seems we don’t have enough quiet places in which to record our work. We’ve tried sending a student into the hall, but unfortunately, she was a little bit disappointed to hear lots of background noises when she played hers back.... We’ll eventually get it all worked out, but it sure would

be nice to be able to put a sound proof barrier up around each desk and let each student create his or her story right there…. And so, all I really want for Christmas is a few more sound proof rooms. That isn't asking much, is it?"

Technical Difficulty

When using technology in lessons, technical difficulties will occur from time to time. It is important for teachers to be be well-trained and prepared for these occasions.

- Teachers should have a backup plan in case a problem occurs. Fortunately, iOS devices need little support, however they can on occasion freeze, the Wi-Fi in a school can go down, and so on. If teachers are prepared with a backup activity or two, they will not panic when an issue arises that forces them to change their plans for technology use.
- A few devices are bound to be lost, stolen, forgotten, uncharged, or broken. The more that students are trained, and more that teachers set clear expectations for technology care, the less this will happen. When a student arrives in class without their iOS device ready to use, it prevents them from being able to complete their work and participate fully. This is not any different from when a student neglects to bring their homework, novel, or lab notes to class. Teachers can require students to complete similar work without their iOS device in these instances. When students find that alternative assignments are less engaging and more labor intensive, they are likely to come prepared in the future.

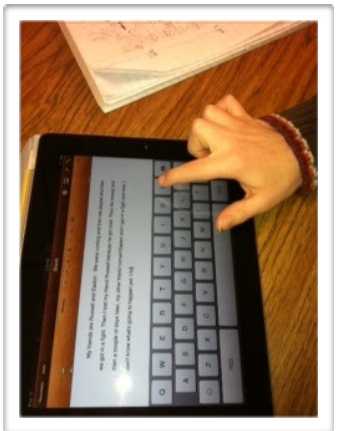
- Training and Professional Development is needed to assist teachers in successfully utilizing their devices in the classroom. Professional Development (PD) at a one-to-one school needs to have a heavy focus on iOS use. Some PD needs to focus on technical use of iOS devices and navigation of apps, however most PD should be content-rich modeling for teachers showing how to teach and engage students with their devices. One could even go so far as to say that all PD at such schools needs to involve iOS devices. Faculty meetings, team meetings, department planning, vertical teaming, BLT meetings, and data meetings should all include iOS devices as a means of communication, note-taking, sharing documents, and learning. The more teachers and administrators use iOS devices in their regular tasks, the more comfortable they will be using them to teach.
- Educational Technology Specialists and Achievement Coaches need to play a large role in training and supporting faculty in iOS use. They need to be available to provide PD trainings, model lessons, offer support, and suggest apps, curriculum connections, and lesson plan examples.

Achievement coaches can be particularly helpful in the use of iOS devices for progress monitoring and data analysis.

Digital Citizenship

Many worry about an increase in unethical behaviors when students have iOS devices at their disposal. The ability to message, search the Internet, and use reference tools make it easier for students to participate in cheating, cyber-bullying, or accessing and sending inappropriate content. If used unwisely iOS devices can be dangerous tools. Students need to be taught what it means to be a good digital citizen. They need to be warned of dangers and pitfalls and given skills to avoid them.

- The following are important digital citizenship concepts to teach students when using any technology device:
  - District Responsible Use Policy
  - Using appropriate sites
  - Respecting others online
  - Devices are tools, not toys
  - Staying on task -- not playing, messaging, gaming, listening to music, etc. during class time unless assigned
  - District Information Release Form
  - Cyber Bullying
  - Be careful what you post -- "It's not a digital footprint, it's a digital tattoo."
  - Online Safety
  - Protecting personal information
  - Do not interact online with people you don't know



- One resource available to assist teachers, administrators, and parents in teaching good digital citizenship and safety skills is NetSafe Utah from the Utah Education Network. Their resources can be found at netsafeutah.org.

Student Use

Some educators think that iOS devices should be used as behavior incentives. While these devices can and should be motivating and engaging, they are tools that should be used as an integral part of each student's educational experience, not rewards for good behavior.

- A teacher would not take a student's pencil, text book, or calculator away because she had too many tardies, for example. These tools would only be taken away if she used them to harm herself or other students. iOS devices should be treated the same way. They are tools required for complete participation in class and completion of assignments. Teachers and administrators should be very cautious about using iOS devices as leverage for unrelated behavior issues.
- Games, music, and additional apps have been used by some schools as incentives for good behavior and student achievement. "Extras" like these can be great motivators for students to comply with school policies and to achieve academically.
- A one-to-one iOS learning environment will work best if every student uses his/her device in every class and at home. This will allow the devices to become useful educational tools, not just every-once-in-a-while novelty items. Only then can the potential of these devices to become catalysts for cross-curricular research, 24/7 learning, problem solving, and efficiency be fully realized.