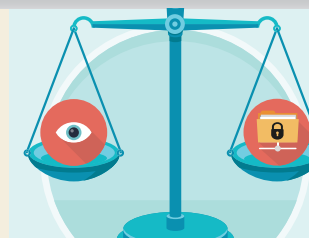


IN THIS ISSUE

8 | DATA PRIVACY

Lesson number one from CoSN's new toolkit: Complying with FERPA and COPPA is just the beginning.



12 | COMMON CORE

These 28 apps, sites and communities will help you teach Common Core — or whatever standards your state adopts.



20 | PRESENTATION TOOLS

Teachers are pairing hardware and software to create lessons that engage students and inspire collaboration.



24 | ACCESSIBILITY

Technology plays a key role in helping students with physical and learning disabilities stay involved, both in class and at home.



27 | RESEARCH

The history of educational technology is a reminder that it's not the machine that matters — it's finding the tool that best serves your educational objective.



DEPARTMENTS

2 | OUR SPACE Education Can't Be 'Hacked'

3 | HERE & NOW Most districts have mobile tech

6 | PRODUCT ROUNDUP BYOD management and more

7 | INNOVATOR Scott Merrick, v-Learning Specialist

31 | INDEX

ENGLISH
LANGUAGE
ARTS



SCIENCE



Taking on the new learning standards may seem daunting, but the Web is a treasure trove of ideas and support. Just click on a topic to find the **free and cheap Common Core resources** that you need.



MATH

PD



OER MANAGEMENT TOOLS



MULTIPLE
SUBJECTS



Christopher Piehler, Editor-in-Chief



What education can learn from the tech world is the process of iteration.

Education Can't Be 'Hacked'

Quick fixes and top-down disruptions are tempting, but true change comes from a longer, messier process.

WE ARE A nation of hackers. Yes, some Americans spend their time infiltrating other people's computer systems for fun, profit or revenge. (We actually ran a gripping [article](#) about that type of hacker last month.) But the larger and more benign group is the [life hackers](#) who, inspired by the culture of computer programmers, are in constant pursuit of tricks or shortcuts to increase their productivity and efficiency. Life hacking's popularity has been helped along by videos of TED Talks, such as [this one](#) about the most effective way to dry your hands with a single paper towel.

With so many hacks out there to deal with the small problems, tech entrepreneurs have become tempted to try hacking the big problems — like public education. A recent *New Yorker* [article](#) detailed what happened when the unlikely alliance of Republican Gov. Chris Christie, Democratic Mayor Corey Booker and Facebook's Mark Zuckerberg tried to hack the Newark, NJ, public school system. The article is eye-opening, but it's also really long, so I'll give the CliffsNotes version.

After meeting with Booker and Christie, Zuckerberg agreed to give Newark schools \$100 million. Booker, Christie and Zuckerberg all wanted to improve the level of education that kids were getting, but in true hacker fashion, they decided that dealing with the existing community structure was too inefficient, so they sought to impose change from the top down. In the absence of public input, they turned to consultants, who were paid millions of Zuckerberg's dollars. Ultimately there was enormous community backlash against the replacement of the lowest-performing public schools with charters, and with the election of a new mayor, the reform efforts are now in limbo.

Education can't be hacked, but I believe that educators can learn something else from programmer culture: the concept of iteration. Rather than considering a buggy beta a failure, programmers look at it as a chance to make a new, better ver-

sion that builds on what they learned from the beta. In an educational system increasingly dominated by the specter of high stakes testing, I think we could all stand a bit more iteration.

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Report: Most Districts Have Deployed Mobile Technology, Want More

By Joshua Bolkan

Eighty-two percent of school districts are “highly interested” in launching or expanding a 1-to-1 technology initiative within the next two years, according to a new report from [Amplify](#) and [IESD](#). The report, the 2014 [National Survey on Mobile Technology for K-12 Education](#), also found that the number of districts reporting that at least one-quarter of their schools had deployed mobile devices had risen to 71 percent, up from 60 percent in 2013.

Other key findings of the report include the following:

- Only 12 percent reported that they didn’t have mobile devices in any of their schools. That’s down from 21 percent in the previous year.



- The most common mobile device deployments reported by survey participants were carts shared among classrooms (approximately 42 percent). Twenty-three percent said some or all classrooms had mobile devices for students to share, nearly 20 percent said classrooms had 1-to-1 deployments and 15.7 percent of respondents said some classes had a full set of mobile devices and others had none.
- Twenty percent of districts surveyed said they had a bring-your-own-device (BYOD) policy currently in development.
- Slightly more than a quarter (28.9 percent) of survey participants said their policy encourages BYOD and 18.4 percent said their policy is to not permit students to bring their own devices.
- About 71 percent of those surveyed said their district had a “high level of interest” in purchasing Chromebooks or tablets.
- Digital textbooks were most often cited as beneficial to students, at a rate of 68.9 percent. Creation tools (54.5 percent) followed, and collaboration tools such as Google Drive were a close third place at 52.1 percent. Productivity tools, such as those for storing files, taking notes and scheduling, came in fourth at 43.1 percent.

[Read the full article.](#)



Should We Teach Kids to Program?



**PRESS
PLAY**

Our intrepid podcasters Cathie Norris and Elliot Soloway say that

students should code, but not as a way to learn problem-solving skills or as a path to a job. Once Elliot has finished singing a bit, they decide that programming is best seen as a way for students to tell interactive stories.

[webinars]

Union County Public School District Goes Google With Chromebooks and Google Apps

In this webinar, you’ll hear from Scott Jacumin, head of instructional technology at [Union County Public Schools](#), about how UCPS is leveraging the Lenovo X131e Chromebook and the power of Google Apps for Education to transform the learning culture of one of the largest school districts in North Carolina. At the heart of this transition are real-world productivity tools that enhance communication and collaboration while engaging students and teachers in project-based problem-solving. Sponsored by Google

New and archived webinars are available at [thejournal.com](#).

Discovery Education Names 2014 DEN Gurus



Discovery Education has announced that

five distinguished educators from across the country have been named 2014 Discovery Educator Network (DEN) Gurus. The DEN Guru program recognizes educators who are transforming teaching and learning with digital content and educational technologies.

DEN Gurus are chosen for their expertise, spirit of collaboration and advocacy for the integration of digital content and educational technology into classroom instruction. To be considered for the honor, applicants must be STAR Discovery Educators. The 2014 DEN Gurus are the following:

Dacia Jones is an area instructional facilitator with Durham Public Schools (NC) and has been teaching for 20 years. She is a National Schools Attuned Trainer and Math

Foundations Trainer.

Alexander (Sandy) MacDougall has been an educator for nearly 30 years. For the last several years, MacDougall has been working centrally as a technology integration leader at Halifax Regional School Board, Nova Scotia.

Sandi Dennis is a library media and instructional technology specialist in City Schools of Decatur (GA). Recently, Dennis helped coordinate a 1-to-1 iPad program that earned an Apple Distinguished School award.

Dave Tchozewski is in his 27th year in education. After 22 years in the high school math classroom, he moved into his current role as director of information technology for Jenison Public Schools (MI). He now leads his district in providing access to appropriate technology services.

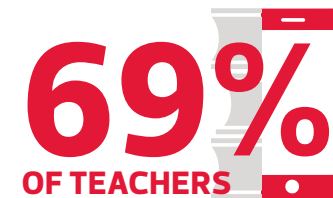
Dennis Grice is a K-8 technology teacher at St. John's Lutheran School in Orange, CA. He is a STAR Discovery Educator and leadership council member and a peer coaching workshop facilitator. [Read the full article.](#)



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With online state assessments helping to spark a digital revolution in schools, your students need the right technology to prepare them for digital learning, online testing and the development they'll need to get to the next educational stage. They need devices, applications, digital content and a reliable network to access it all quickly.



say educational technology enables them to do "much more than ever before" for students.¹



say that the Internet has a major impact on their ability to access important teaching materials.²



ONLY 28% OF PUBLIC SCHOOLS have the broadband speed necessary to reliably access the Internet.³

WE GET IT.

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We work with niche partners like Promethean to offer interactive and collaborative technology for classrooms, and help you create a more robust learning environment for teachers and students.



THE PLAN

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From classroom technology to Common Core necessities, we can help. See how at CDWG.com/commoncore



¹PBS Learning Media Survey, pbs.org, Feb. 2013 ²Pew Internet, *How Teachers Are Using Technology at Home and in Their Classrooms*, pewinternet.org, 2013 ³Washington Post, *Getting Schools Up To 21st Century Speed*, washingtonpost.com, 2013 ©2014 CDW Government LLC. CDW®, CDW-G® and PEOPLE WHO GET IT™ are trademarks of CDW LLC.

{win big!}



FIRST LEGO League Gives Global Innovation Awards

Students' creative ideas for how to prepare, stay safe, and rebuild following natural disasters became award-winning inventions at the fourth annual *FIRST* LEGO League Global Innovation Award ceremony, held at the U.S. Patent and Trademark Office in Alexandria, VA. Dean Kamen, inventor and founder of *FIRST*, a not-for-profit organization created to inspire young people's participation and interest in science and technology, honored the winners.

More than 500 *FIRST* LEGO League teams across the globe submitted their inventions. A panel of expert

judges reviewed the submissions, narrowed the list to three finalists, and then selected a winning team and two runner-up teams. The winning team received a cash award of \$20,000 and the two runner-up teams each received \$5,000.

The winner was the Balloon-Based Notification Sign, created by The Brain Busters of Sherborn, MA (pictured). The sign indicates where to find aid after a natural disaster, when traditional infrastructure is not available. A large sign is suspended from a helium balloon that can be seen from very long distances and deployed in high winds, snowstorms and extreme cold.

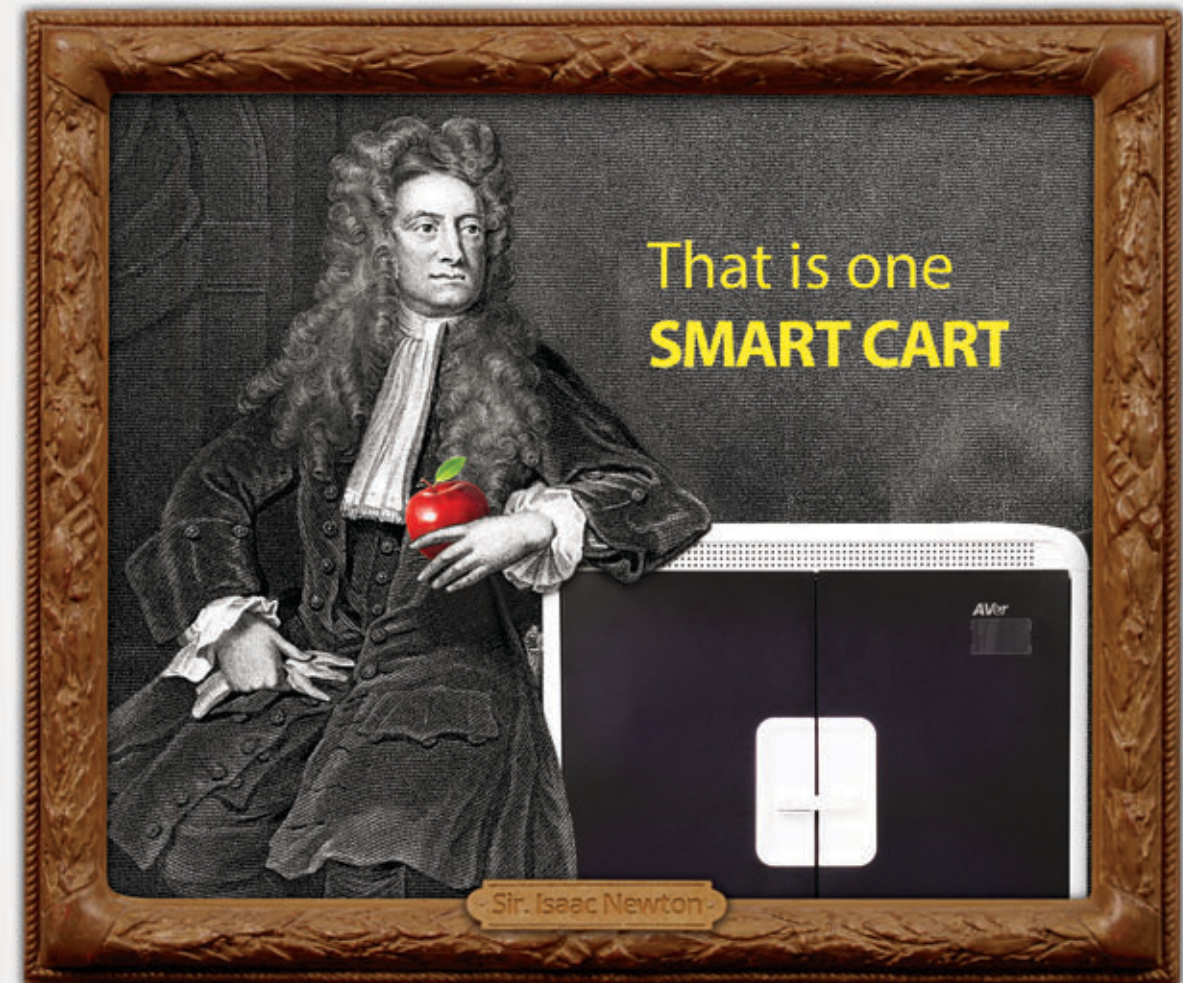
breaking news

Live Feed

- Oklahoma Governor, Once a Common Core Supporter,

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- E-Rate Demand Increasing 06/05/14
- Houghton Mifflin Harcourt To Launch E-Reader App for Windows 8, 8.1 06/05/14
- Alberta District Rolling Out 5,000 Chromebooks This Summer 06/05/14
- Android Education Tablets Get Multiple Account Support 06/05/14



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TabChargeCT2 40 device charging cart. So smart, its innovative and intelligent design was recently awarded a prestigious RedDot 2014 Design Award in Germany! Find out more at www.averusa.com/education.

Visit us at ISTE booth #1948 to learn more and for a chance to win AVer F50 document cameras and an iPad Air!



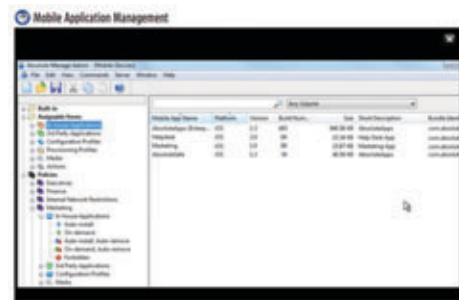
Product Roundup

Editor's
Picks

The latest hardware, software and services



Google is adding new features that allow multiple students to share a single Android-based education tablet. Tablets that support [Google Play for Education](#) will now be able to support up to five user accounts. [Read the full article.](#)



Absolute Software's [Absolute Manage](#) system now automates BYOD policies for laptops, tablets and smartphones from a single console. It provides enrollment workflows as well as remote and automated security protocols. [Read the full article.](#)



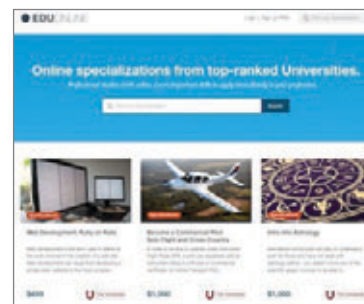
[Prologic](#) has added online student registration to its [TEAMS](#) enterprise resource planning platform. The new registration tool will allow parents of new or current students to add or edit information. [Read the full article.](#)



[Aleratec](#)'s new Charge and Sync Station Mini 10 is a 10-port station small enough to fit into a laptop bag or desk drawer. It supports iOS, Android and most other platforms. The station comes in an all-metal enclosure. [Read the full article.](#)



[Edgenuity](#) has released a new Algebra I course for blended classrooms. Features include on-screen teachers thinking aloud to model problem solving, guiding questions for each lesson, and interactive tools. [Read the full article.](#)



[Instructure](#) has launched Canvas Catalog, a new service that lets schools host their own branded distance courses and course catalogs online. The catalog supports custom course landing pages, payments and more. [Read the full article.](#)

new releases

AV & Presentation

- [MimioStudio 11.2 Adds Free Mobile Access](#)
- [Microsoft Office Mix Turns PowerPoint Presentations into Online Interactive Lessons](#)
- [Crestron Intros New Room Scheduling Touchscreen](#)
- [Smart Technologies Intros Interactive Flat Panel for Education](#)

Enterprise Systems

- [Yammer Enterprise Coming to Microsoft Office 365 Education Plans](#)

Infrastructure & Facilities

- [Aleratec Introduces New Charge/Sync Cabinet](#)
- [Ruckus Ships 3-Stream 802.11ac Access Point](#)

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Mobile Computing

- [Android Education Tablets Get Multiple Account Support](#)
- [Surface Pro 3 Gets 12-Inch Screen, Upgraded Processors](#)
- [iGear Offers Customizable iPad Keyboard Case](#)
- [FileWave Releases Mobile Device Management Update](#)

Security

- [LRAD Launches Mobile Long-Range PA System](#)

Teaching & Learning

- [Instructure Launches White-Label Distance Learning Platform](#)
- [JoomlaLMS 1.3.2 Improves SCORM Compatibility, Adds AICC Compliance](#)
- [Clever Replaces Usernames and Passwords with 'Instant Login'](#)
- [Moodle Legacy Versions Get Security Updates, Bug Fixes](#)

SCOTT MERRICK, V-LEARNING SPECIALIST, METROPOLITAN NASHVILLE PUBLIC SCHOOLS (TN)

INNOVATOR

>> CLICKS OVER BRICKS

In July 2010 I was approached by Dr. Kecia Ray, now president of ISTE, to move from my decade-plus private school teaching job into the public sector. **Metropolitan Nashville Public Schools**, where Dr. Ray was executive director of learning technology, wanted to create an online school option for its 80,000-plus-student school district. We established MNPS's virtual learning program, housed in **Nashville Middle College High School**, that first year while researching methods to create a sustainable and cost-effective actual school. After Tennessee legalized virtual schools in the summer of 2011, ours was the first approved.

>> HIGH STANDARDS

We have a broad range of kids: the energetic students who want to accelerate and explore advanced options like dual enrollment or advanced placement; students who are out earning incomes and pursuing careers; young mothers and fathers who need to be at home; and kids who have been bullied or faced other adverse social behaviors in brick-and-mortar schools. The one thing we wanted to make sure of is that the virtual school didn't become a haven for kids who just don't want to go to school. People now understand that this is very challenging

material, from **Florida Virtual School** and **eDynamic Learning**. We have a school counselor who interviews students before they enroll to make sure this is the right program for them and that they understand this won't be easy.

>> KEEPING STUDENTS UP TO SPEED

The online environment allows students to go at their own pace, but it has to be a minimum pace. We have established a system of support called Performance Concerns, which means that everyone is in the loop when students start to fall behind. We also tie it to attendance. A student can be deemed truant if he or she has fallen a certain percentage of each course behind our Pacing Guide. For those who do fall behind, there is detailed communication from teachers to students, parents and school counselors, as well as timely intervention. As a result, we are a very high-performing school. We just got our ACT scores back, and we performed well above the district average.

>> UP FOR DISCUSSION


We want students to take responsibility for their own learning. When they do that, that's something they can carry with them into the world. At the same time, we have a strong intervention protocol to make

MY TOP 3



Merrick shares his favorite educational technologies.

sure no one falls through the cracks. Our system of support includes once-a-week tutoring in math, languages, science and English language literacy that attracts small groups of students. At the end of a module there is a discussion-based assessment: a required telephone conversation, guided by a rubric, in which the teacher will ask questions directly related to what the student has just learned. If the student performs in a shaky manner, the teacher will have him or her go through it again, then hold another assessment.

Many students say they get to know their teachers better in this platform than they have in brick-and-mortar classrooms. 

10 Steps That Protect the Privacy of Student Data

CoSN is now offering a free toolkit to help districts navigate the tricky issue of data privacy. Lesson number one: Complying with FERPA and COPPA is just the beginning.

Over the past year, data privacy has become a top concern of parents and policymakers. Lead news stories on national security surveillance and the theft of department store credit card information have heightened awareness of the issue and escalated the debate on the political right and left. In education, concerns about privacy were a contributing factor to the failure of the [inBloom](#) effort.

In this context, education leaders must be ready to explain why they collect data and how they are ensuring the protection of student information. Much of the current discussion is about compliance with federal laws such as the Family Education Rights and Privacy Act ([FERPA](#)) and the Children's Online Privacy Protection Act ([COPPA](#)), but mere compliance is the minimum effort required by school systems.

When FERPA was enacted in 1974, no one could have imagined the implications for privacy in a world dominated by the Internet, cloud services, online learning and mobile apps. Even since COPPA took effect in

2000, the world of education technology has changed radically. Education leaders want to act in the best interests of the students and families that they serve, but applying laws enacted from an earlier time is incredibly difficult. Coupled with the growing realization of the value of data for both educational and commercial purposes, school leaders can sometimes find themselves at odds with the service providers on which they depend for valuable educational tools.

Why We Collect Data

Educators and policymakers increasingly realize the promise of using student data to make informed decisions on issues from classroom instructional practices to investment in education programs. By collecting data about student use, online services can offer a much more personalized experience. Balancing the benefits



of these technology advances with the need to protect student privacy and data is a major challenge. It is critical that education, industry and policy leaders

DATA PRIVACY

find ways to ensure student privacy while continuing to encourage innovative uses of technology and student data. Equally important is communicating to all our stakeholders about the data being collected and the purpose of its collection.

School system technology leaders need information and guidance intended specifically for them and developed by those with a deep understanding of education technology issues. The Consortium for School Networking (CoSN), in partnership with Harvard Law School's Cyberlaw Clinic based at the Berkman Center for Internet and Society, has recently released the free Protecting Privacy in Connected Learning Toolkit, a step-by-step guide to navigating the complexity of FERPA, COPPA and related privacy issues. Of course, considering the highly technical nature of privacy laws and policies, school leaders should always seek advice of legal counsel regarding such issues.

Understanding Legal Compliance

Navigating through privacy issues and FERPA and COPPA compliance can quickly become confusing for school system leaders, and the CoSN Toolkit is organized as a step-by-step flow-chart. It not only addresses FERPA and COPPA compliance issues, but suggests practices that reach beyond compliance.

Embedded in the toolkit's decision tree are definitions, checklists, examples and key questions to ask along the way. The toolkit offers a detailed definition of terms such as "education record" and "school official," and suggests contract terms and security questions for service providers. Also included are explanations of issues related to metadata, data de-identification and "click-wrap" agreements, which are common to free online services. The toolkit also offers a set of helpful Internet links to privacy-related resources.

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Activ. Fee: \$36/line. Credit approval required. **Family Plan:** Offer ends 7/10/14. Month-to-month term. Includes unlimited domestic Long Distance calling, texting and 1GB/mo./line on-network data allowance. **Add'l Data:** 1.5¢/MB. Third-party content/downloads are add'l charge. Int'l svcs are not included. Pricing may vary for existing customers. Max of 10 phone lines per group. Excludes existing accounts and discounted phones. Group members must agree to share their names, last 4 of phone numbers, Family ID, group status and that they are subscribed to Family plan with group. To withdraw consent, member must enroll in a different service plan. Withdrawal does not affect ability to subscribe to other plans. Sharing Family ID allows others to join group. All group members may invite others to join. Separate bills are per account. **Family Discounts:** Awarded \$5-\$30/mo./line off \$55 base rate plan depending on number of members in the group. Discounts not prorated. Groups cannot merge. **Usage Limitations:** Other plans may receive prioritized bandwidth availability. Streaming video speeds may be limited to 1 Mbps. Sprint may terminate service if off-network roaming usage in a month exceeds: (1) 800 min. or a majority of min. or (2) 100MB or a majority of KB. Prohibited network use rules apply — see sprint.com/termsandconditions. **3GB Buy-Up:** Includes 3GB/mo. on-network data allowance. Add'l on-network data usage 1.5¢/MB. Does not combine or stack with other data. **Unlimited Data and Annual Upgrade Buy-Up:** Req. min. 12 consecutive payments, new Installment Agreement, acct. in good standing & give-back of current eligible device in good & functional condition. After upgrade, remaining unbilled installment payments are waived. **SDP Discount:** Avail. for eligible company employees or org. members (ongoing verification). Discount subject to change according to the company's agreement with print and is avail. upon request for monthly data buy-up svc charges for Family plan. Not avail. with no-credit-check offers or Mobile Hotspot add-on. **SDP Visa Prepaid Card Offer:** Offer ends 7/10/14. SDP only. While supplies last. Excludes tablets. Device requires activation at point of sale. Visa Prepaid Card request must be made at sprint.com/promo or Visa Prepaid Card will be declined. New line must remain active and in good standing for 30 days to receive Visa Prepaid Card. Subject to CL corporate gifting policy. Allow 10-12 wks for delivery. May not be combinable with other offers. Other req. may apply for installment customers. See store or sprint.com for details. **Visa Prepaid Card:** Cards are issued by Citibank, N.A. pursuant to a license from Visa U.S.A. Inc. and managed by Citi Prepaid Svcs. Cards will not have cash access and can be used everywhere Visa debit cards are accepted. **Other Terms:** Offers and coverage not available everywhere or for all phones/networks. You can view the Sprint privacy policy at sprint.com/privacy. May not be combined with other offers. Restrictions apply. See store or sprint.com for details. © 2014 Sprint. All rights reserved. Sprint and the logo are trademarks of Sprint. Other marks are the property of their respective owners.

DATA PRIVACY

As the interpretation of privacy laws evolves along with privacy laws themselves and the technology services they seek to govern, the CoSN Protecting Privacy in Connected Learning Toolkit will evolve as well, with information forthcoming on compliance with other federal student privacy protection laws.

Beyond Compliance to Aspirational Practice

If mere compliance is insufficient, what should responsible school systems be doing when it comes to privacy? In a new report underwritten by Intel, Bob Moore, director of CoSN's Privacy Project and founder of RJM Strategies, suggests 10 steps that every school district should take to better ensure the privacy of student data:

1) Designate a privacy official. Decide who in the district is responsible for privacy. A senior administrator should be designated as the person

responsible for coordinating efforts to ensure compliance with privacy laws and policies.

2) Seek legal counsel. All schools have access to the services of legal counsel. Regardless of how your school receives those services, make sure your counsel understands the privacy laws and how they are applied to technology services.

3) Know the laws. This is not easy, but it is essential. In addition to the CoSN Toolkit and resources from the U.S. Department of Education, many other organizations have developed or will be developing privacy-related materials. Don't forget about state laws or proposed state laws.

4) Adopt school community norms and policies. FERPA and COPPA compliance is the bare minimum when it comes to protecting privacy. There must be consensus among



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When it comes to educational technology, one size doesn't fit all. From the #1 Chromebook in the market* to the new Samsung Galaxy Tab® 4 Education with Google Play for Education to the best-in-class Samsung School solution, we provide more than just one-size-fits-all technology. We provide your school with products designed to inspire the New Learning Experience.

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DATA PRIVACY

your stakeholders regarding collecting, using and sharing student data. Without consensus, it's impossible to adopt enforceable policies.

5) Implement workable processes. If your school is going to be serious about privacy, there must be processes that include checks and balances for accountability. No one wants to create roadblocks to innovation, but ensuring privacy requires proactive planning and disciplined action on the part of school staff. Compliance with privacy laws suggests some specific processes for schools, and school leaders should review these policies

regularly to ensure that they are workable and reflect current interpretations.

6) Leverage procurement. Every school RFP, bid and contract (or service agreement) has standard language dealing with a wide range of legal issues such as indemnity, liability, payment and severability. By adopting standard language related to privacy and security, you will make your task much easier. Many online services are offered via click-wrap agreements that are “take it or leave it.” It may be necessary to ask staff to look for alternative solutions if the privacy provisions do not align with your expectations.


7) Provide training. Unless you train your staff, they will not know what to do or why it is important. Annual privacy training should be required for any school employee who is handling student data, adopting online education apps or procuring and contracting with service providers. Privacy laws represent legal requirements that need to be taken seriously.

8) Inform parents. Parents should be involved in the development of privacy norms and should provide policy input. Just as schools provide significant information about online safety and appropriate use, they

should put significant effort into making sure that parents understand the measures that educators are taking to protect student privacy.

9) Make security a priority. The importance of security to ensuring privacy cannot be overstated. Secure the device, the network and the data center. Toughen password policies. Have regular security audits conducted by a third-party expert. Make sure that RFPs, bids and contracts have clear and enforceable security provisions for your online service providers.

10) Review and adjust. Interpretations of privacy laws are changing, and new laws may be added. School policies and practices will need updating and adjustment so that they reflect legal requirements. Processes can become burdensome and when that happens, some people may want to skirt the process. Seek input from those involved to ensure that the processes are not hindering teaching and learning.

Most importantly, get started now before the privacy questions create a firestorm in your community. Be a privacy leader. 

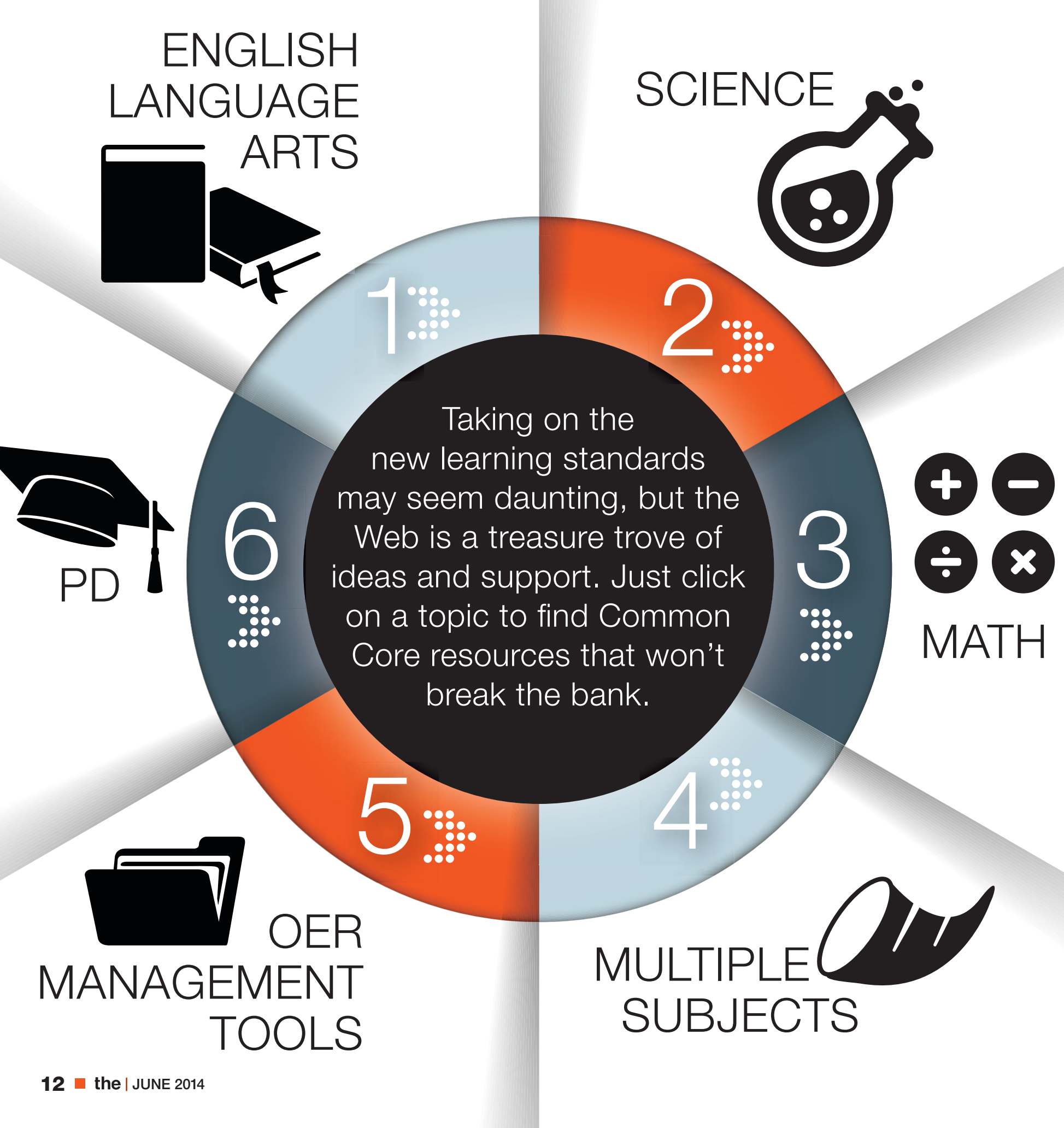
Keith R. Krueger is the CEO of the Consortium for School Networking (CoSN).

WHY YOU NEED A CPO



VIDEO: Bob Moore, project director of CoSN's Protecting Student Privacy initiative, extols the benefits of appointing a chief privacy officer. [See all this month's videos.](#)





28 Free and Cheap Resources to Help You Teach Common Core

By **Dian Schaffhauser**

YES, WE KNOW it's tough to make the transition to the Common Core State Standards — or whatever new learning standards your state has put in place for math, English language arts and science. But there are plenty of amazing resources out there designed to help you come up with new lessons, get professional development and manage your OERs. So if you're looking to invigorate your classroom with games, video, personalization and other student favorites, this list is a great place to start. And best of all, most of the tools below won't cost you or your school a dime. ►►

English Language Arts

BoomWriter

Looking for ways to get your students to practice their writing skills? This site facilitates in-class book-writing contests. The teacher selects a story start or inserts a first chapter, and the students write, read and vote on the submissions that will make up the following chapters. Once the books are done, they're produced as real volumes and put up for sale in the site's bookstore for \$9.99 each. While the service is free for teachers who have at least a handful of students, there is a subtle push to students to join the premium \$39.99 "writing club." Club members get one free book a year, avatar accessories and access to celebrity author contests.

Subtext

Last year, Renaissance Learning acquired K-12 digital reading program Subtext, and we're happy to say that

the transition has been a good one. The free app on [iTunes](#) and [Edmodo](#) still exists. Teachers can still create private groups to share content with students and keep discussions closed and add notes, polls, quizzes and Web links for students. The program works with eBooks, PDFs and Web articles.

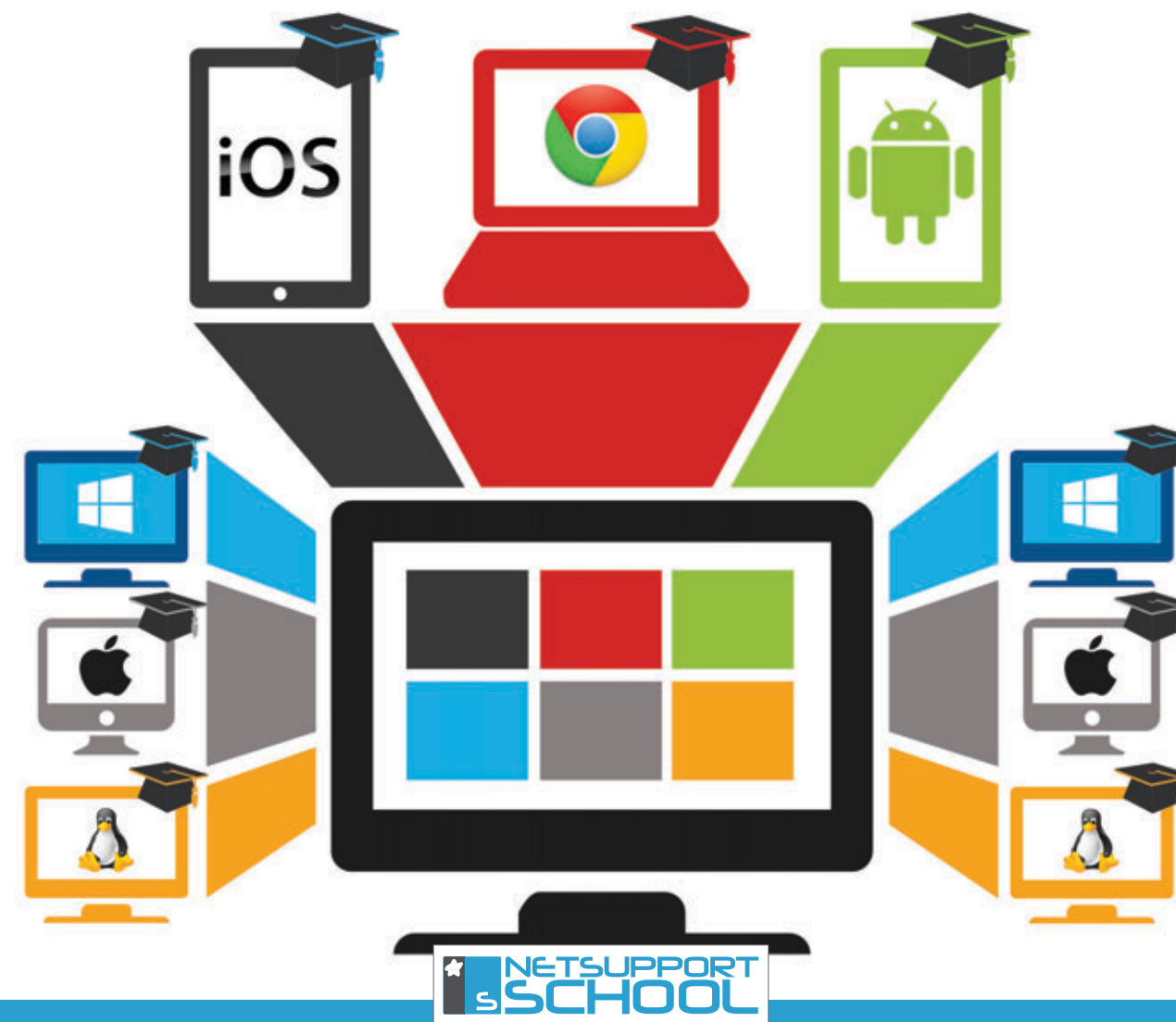
A new premium edition (\$2.99 per user) adds the abilities for teachers to track students' reading progress, convert text to speech at any reading speed, access 50 templates that can serve as CCSS or state standard assignments and engage in an educator community to share assignments and ideas. Greg Garner, educational technologist at **West Ridge Middle School** in Austin, TX, said "While my district is 1-to-1 with iPads, Subtext works on a wide array of devices and is hands-down the best app I've used to improve student literacy and comprehension."

Text Compactor

This "free online automatic text

Classroom management
now includes support for
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NetSupport



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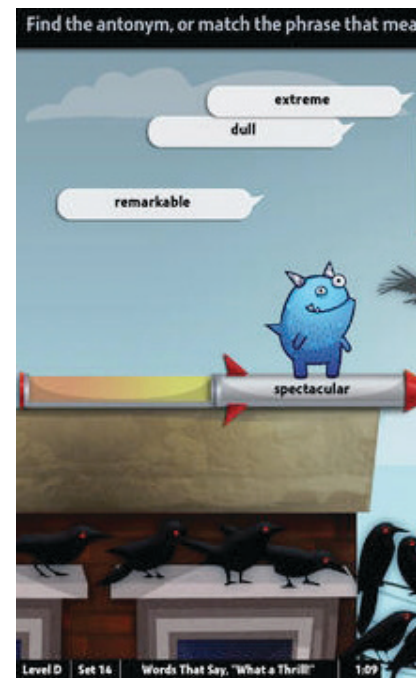
summarization tool” was created by Knowledge by Design, which produces products for students with disabilities. The user plugs in a paragraph of nonfiction, sets a slider to the percentage of text that should remain, and the newly shortened or summarized text appears in another window. Dave Edyburn, a professor at the [University of Wisconsin-](#)

FILLING IN THE GAPS



VIDEO: Students and teachers from Summit Public Schools (CA) share how they use the free resources from Activate. [See all this month's videos.](#)

Milwaukee who helped develop the tool, said, “Tiered text offers diverse students many more opportunities to access and engage with text. I think one of the most valuable instructional design principles for digital learning materials is tiered text. Websites like [TweenTribune](#) offer content at multiple levels of difficulty. This means the learner must assume the role of Goldilocks and determine which text is just right, given their purpose for reading, background knowledge and skill level.”



World's Worst Pet

This iPad freebie from [Curriculum Associates](#) is designed to help develop vocabulary in alignment with Common Core’s goal of reading and understanding complex text. Relevant for assessments in grades 4 through 8, this game pushes players to use their vocabulary skills to keep Snargg, the “troublesome pet” of the BakeStars, out of trouble. Snargg has different ideas, however, and keeps escaping.

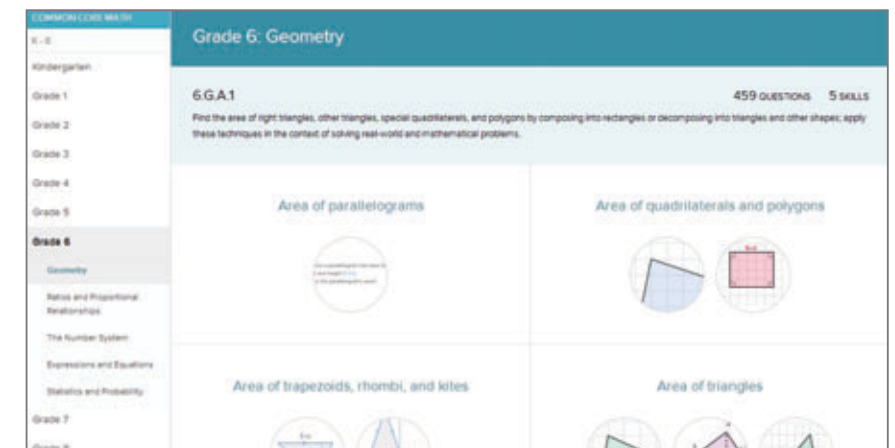
Math

Door 24

Curriculum Associates also offers a free iPad app that mixes math practice with gaming. Intended for grades 4 through 8, Door 24 provides practice on the use of number facts, order of operation and algebraic thinking. Students work through six levels and multiple sets of problems to help Victor the robot get at the mystery behind Door 24. Door 24 doesn’t cover all CCSS math standards; but for free, who’s complaining?

Khan Academy Math “Missions”

The Missions are a collection of interactive math exercises, explanations of the solutions and links to the ubiquitous videos. Teachers gain access to maps to help identify math drills by standard, and they get reports that communicate student performance against the CCSS.



Virtual Nerd Math

Pearson Education acquired Virtual Nerd in 2013, and has maintained its free video math tutorials that correlate to CCSS. For on-the-go help, the company has a free mobile app for the iPhone and iPad, with an Android edition in the works. “I love Virtual Nerd,” said Angela Irwin, teacher at **Northwest High School** in Justin, TX, “because the videos are simple and concise, and the instructor is visible to the student. Also, QR codes make them easy to access, even from a cell phone.”

Science

National Science Teachers Association

Every single day of the school year, the NSTA posts another freebie resource for science teachers. Recent offerings include a link to a [Curious George STEM collection](#), links to videos from the Department of Energy that explain the [fundamentals of energy](#) to middle and high school students and K-12 teacher links for staying in touch with the astronauts working on the [International Space Station](#).

Teachers TryScience

Here are hands-on science lessons contributed by teachers, organizations and companies that can be plucked out of the collection by topic, grade, age or esti-

Activity	California Science Standards
How Big Is It? Investigating size and scale using the metric system. NEW! Teacher lesson guide and answer key	Grade 2, Standard 4b – express measurements in metric system units Grade 4, Standard 6c – estimate the length of objects
Pour It Out	Grade 5, Standard 1g – properties of water

mated time required. The site also includes a few teaching strategies and a number of communities formed by site members to pull together people with similar interests, such as Vietnamese teachers or teachers interested in biology. The site is available in English and Spanish. The only caveat: No new lessons have been added since mid-2013 — a light-year away when it comes to science topics and professional development guidance.

Multiple Subjects

Activate Instruction

This free and open online database, created by a group

of education nonprofits and two public schools, offers Common Core-aligned materials that continue to grow as users contribute more learning resources. Content includes activities, videos, lessons, projects and book recommendations. Searching lets you choose grade level, type of resource, academic standard and other filters. Users can set up a “playlist” or “follow” certain teachers or schools, and schools that use the Activate API to hook in their student assessment data system can receive compilations of recommended resources based on student results.

ArtsEdge

The Kennedy Center’s site for educational outreach offers free arts-based lesson plans and projects. You can filter by keyword, grade, art subject and other subject. For example, a project on Alexander Calder examines the concepts of balance for grades 5 through 8, hitting on visual arts, math and science. The lesson includes an overview, preparation guidance, various instructional activities and mapping to the standards to which the lesson is tied. According to Mike Gorman, director of professional development technology and curriculum integration for **Southwest Allen County Schools** in Indiana, “The emphasis on STEM disciplines, the arts and literacy naturally resonate with Common Core

practice along with the design and innovation process important to Next Gen Science Standards.”

Common Core: Making the Connection

This blog, published by children’s book author and teacher Carol Malnor, connects picture books with lessons. Some of the books are by her; some are by others, but each entry provides information about suggested grade level, lessons, activities and the connection to CCSS and Next Gen Science Standards. But the reason Lori Spencer, a fourth- and fifth-grade teacher at **Nevada City School of the Arts** (CA), likes the site is because she takes its “weekly clues” to use as a daily brainteaser for students. She writes these on the whiteboard before students arrive and works through them first thing. “I use the daily brainteasers for several reasons,” she said. “One, it engages the student the minute they walk into the room; and two, because

it encourages them to think outside the box in order to solve it. While some questions are literal, many solutions involve reading between the lines and using logical reasoning.”

Howtosmile.org

This online tool lets educators search, collect and share science and math activities. Activities come from multiple children’s science museums, don’t require labs to do them and can be used in non-classroom settings. Activities take multiple forms: downloadable lesson plans, videos and online interactive games. Registered users can access “value-added community” aspects and add their own resources to the collection. According to Gorman from Southwest Allen County Schools, “Here [you’ll] find lessons across the STEM disciplines that emphasize the design thinking found in Next Gen [Science Standards] while investigating real world problem-solving essential in the CCSS.”

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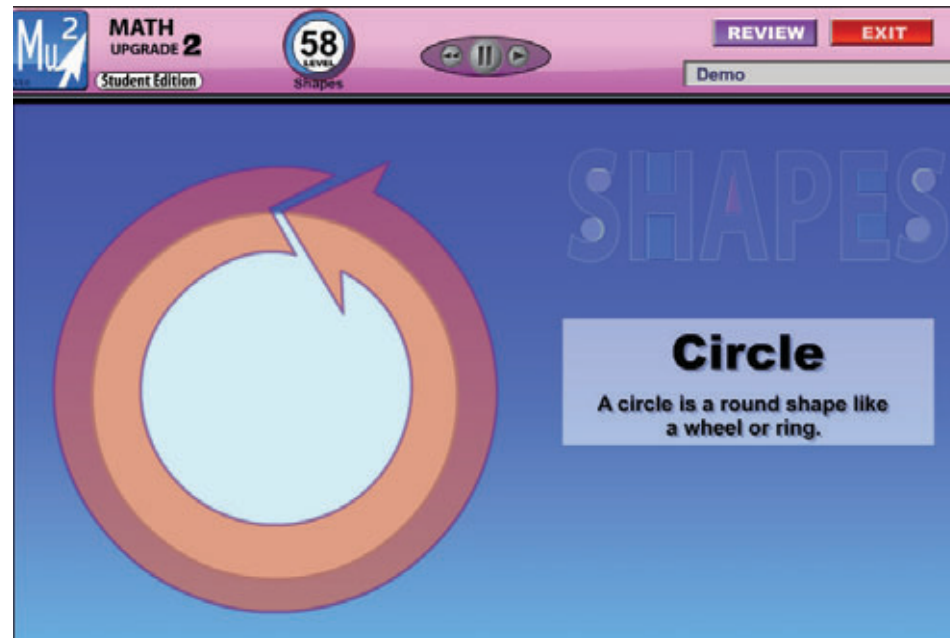


instaGrok

Forget about directing your students to static sites to do their research. Teach them how to find relevant resources themselves through instaGrok, a service that allows the user to research a topic by developing an interactive concept map with videos, websites, definitions, images and quizzes that can be customized and shared. The site is free for students; if a teacher wants to set up a classroom account with all kinds of educator features, that's \$45 a year. According to Letia Cooper, iLearning coordinator at **Beaufort County School District** (SC), "The Common Core literacy standards focus on a student's ability to research and present knowledge. This tool is the high-tech way to research across the Web and meet the standards instantly."

Learning Upgrade

Wonder what the folk artists from Christopher Guest's mockumentary *A Mighty Wind* did after the movie was made? Maybe they went to work for Learning Upgrade, composing the songs that populate this set of Common Core-compliant courses that help students learn math and reading "through songs, video and games!" (And yes, they find a rhyme for "quadrilateral.") Seriously, the free edition



can be used by up to 20 students in a school and one teacher on a whiteboard; after that pricing is \$30 per student per year or \$7,500 for a schoolwide license. Web-based reports allow educators to track progress for students, classes and entire schools.

LearnZillion

This for-profit company selects 200 "highly qualified" practicing teachers from around the country each year to create its video lessons. The Dream Team meets at an all-expenses-paid, three-day professional development event that immerses them in the Common Core. Within the online service, a Navigator leads the teacher or learning coach to lessons covering specific standards.

MobyMax

This K-8 curriculum, built on CCSS, is designed to create a personalized learning path for every student. The company promotes itself as helping teachers "find and fix missing skills"; it entices students with free prizes (snap bracelets, flexi-rulers and "mood" pencils), gaming features, badges and certificates. The free edition covers math, vocabulary, language and reading. For a \$79 annual subscription, the Pro version adds a writing assignment module, test prep modules, printable worksheets and more.

Draw inferences from the text
In this lesson you will learn how to make a valid inference by analyzing parts of a text.

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Let's Review

KidsPost
SUNDAY, MARCH 10, 2012

Girl power

Low, who was nicknamed "Daisy," had grown up as a wealthy Southern belle. She enjoyed painting and performing in plays. Daisy loved animals and had many dogs and cats, including dogs, cats and a parrot. She met and married a handsome young man named William Marler Law, whom she called "Billow." Together they moved to England in 1817, where Daisy met Queen Victoria and the couple lived an aristocratic life. But she also had some difficulties.

When she was in her 20s, Daisy became partially deaf in one ear when an infection wasn't treated properly. Then, on her wedding day, a grain of rice became lodged in her other ear, which eventually caused her to lose most of the hearing in that ear as well. Later in life, Daisy would use her deafness to her advantage, often pretending to not understand people when they said they couldn't understand or change to her beloved Girl Scout.

Daisy's marriage wasn't all that happy. Billow wanted to divorce, but he died in 1855 before she happened.

An idea is born

After Billow died, Daisy was left. They had no children, and she wasn't sure what to do with the rest of her life. Then one day, she happened to be seated next to a charming man at a luncheon in London. He was Sir Robert Baden-Powell, whom everyone called "B.P.," and he had founded the Boy Scouts just a few years earlier. He had a problem: Girls — thousands of them — were springing up all over the world. They showed up at a big rally with homemade uniforms and signed to with their initials. He wanted them to be a group for girls, but he needed help naming it. As Daisy and B.P. talked, Daisy, who was now in her early 50s, became interested in starting a scouting group for girls, not only in England but also in the United States.

When she returned to Georgia, they adopted her name and said: "Daisy" helped girls blossom.

Daisy's scouting group was the first in the world. Billow would be proud.

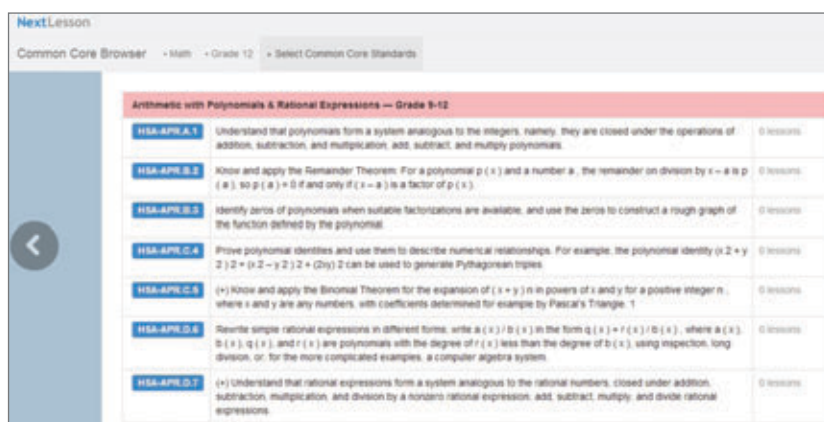
In an informational text facts are often presented as explicit details.

However, sometimes we have to make inferences in order to completely understand the author's message.

LEARN ZILLION

NextLesson

About 20 percent of the 500-plus projects and lessons included in this site are free; others require a premium account, which costs about \$2 per month per teacher. You can hunt up lessons on by grade, subject and Common Core standard.



PBS LearningMedia

A free account gives you access to the PBS library of educational content, which you can hunt down by standard, grade level, subject or collection. Material comes in multiple forms: video, audio, document and interactive.

OER Management Tools

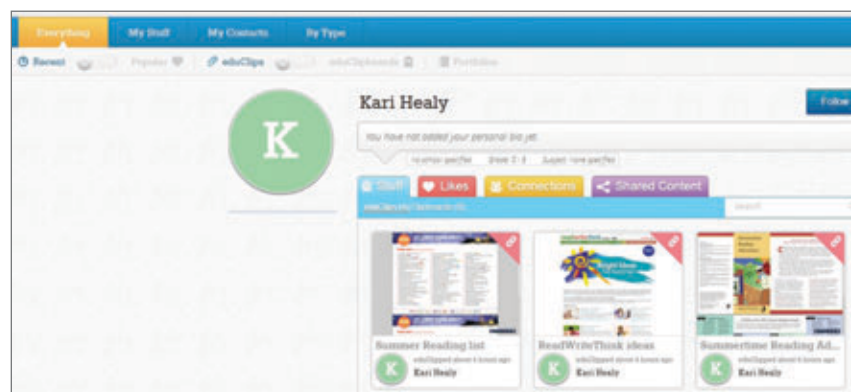
CK-12

Tired of waiting for publishers to create the books you want for your classroom? Create your own! That's the idea behind nonprofit CK-12, which helps teachers to

assemble their own "FlexBooks" from 15,000 learning objects that are mapped to standards, Common Core and otherwise. The digital content comes in the form of text, video, audio, image, quizzes and activities. CK-12 provides content in 80 languages, from Afrikaans to Zulu.

Educlipper

This "social learning platform" for PCs and mobile devices works like Pinterest for the classroom. Educators can post content to their personal eduClipboard web-



site from their local drive or another website, add a title, description and tags and make it available to a student, class or the wider world of teachers. You can also make collaborative Clipboards as a class project.

Gooru Learning

This collaborative community helps educators find free, open learning materials that can be rated, remixed and

shared. Teachers can browse the library for relevant multimedia materials, add them to his or her collection, then assign it to the students. Each collection includes information about which CCSS it relates to, tells how many times it has been viewed and offers related concepts. The collection can be organized with narration, questions and the addition of personal materials. The company claims 16 million learning objects in its catalog and 50,000 teacher-created collections in math, ELA, science and social sciences.

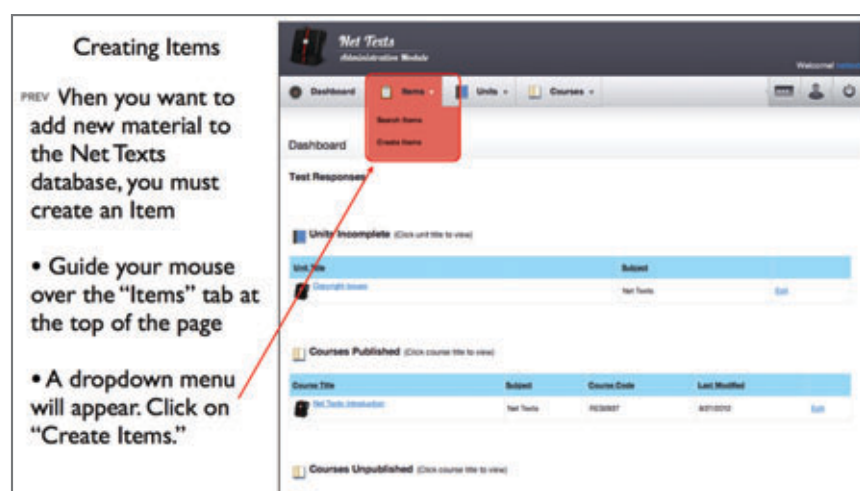
Lesson Planet

Overwhelmed by the hundreds of thousands of apps, lesson plans, videos and presentations available to you? Lesson Planet is a search engine and rating system that lets you find resources by any number of criteria, including CCSS and other state standards. This one isn't a freebie (you can try it for 10 days), but it is low cost: about \$60 for a year's access.



Net Texts

This freebie allows an educator to manage and customize open educational resources into a custom textbook for use with tablets and laptops. But you don't have



to begin with a blank slate. You can use the starter books already available for math (grades 5 through 12), English (grades 6 through 10) and science (grades 6 through 12). If your school wants to make the shift to OER entirely, the company provides consulting to help with the transition.

Professional Development

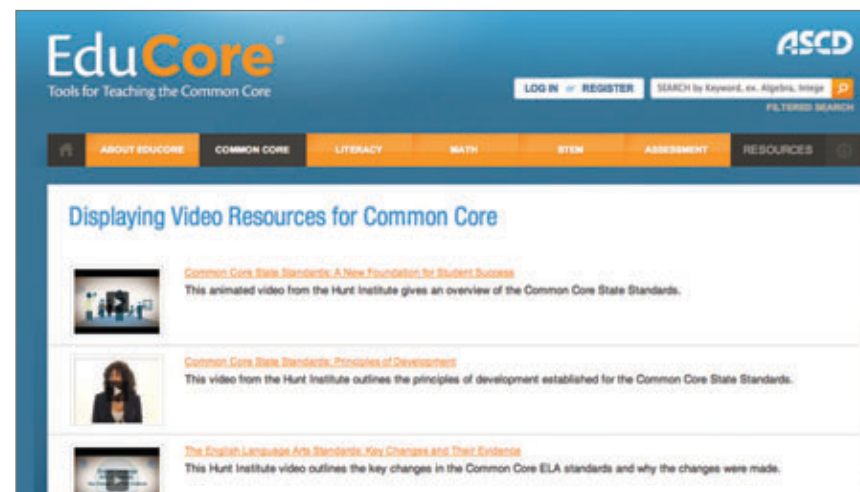
Discovery Education Common Core Academies

As of this writing, the company will be offering sessions in Washington, Connecticut, California, Colorado, Illinois and Florida. Whether you register for a session in

math, ELA or leadership strategies, you'll get breakfast and lunch, two sessions of virtual follow-up, eight hours of professional development credit and a 60-day free trial to Discovery Education's Streaming Plus service. Space is limited, so don't lollygag!

EduCore and Virtual Learning Network

EduCore is packed with professional development opportunities focused on helping teachers make the shift to CCSS. Resources include videos, presentations, on-demand webinars and modules for use in the classroom. VLN delivers free webinars on the same subjects as well as science and social studies, plus it includes private online communities where you can learn from and help fellow educators. Both come courtesy of [ASCD](#) and are funded the [Gates Foundation](#). Eric Russo, special ed teacher at [Drew-Freeman Middle School](#)



in Maryland, has taken questions out of the EduCore templates and inserted them into his own lesson plans. He also appreciates the video tutorials. "It is useful to see a technique modeled or explained through demonstration," he said. "One of the most useful videos I have viewed dealt with complex text and close reading, which are two very key topics in reading under CCSS. This video demonstrated how different standards can be addressed through one text, and how rich discussion can stem out of very precise passages. Most importantly, it gave me strategies that I could implement in the classroom the very next day."

Pearson OLE Community

The Online Learning Exchange is a paid service, but you can sign up to receive the company's newsletter, which will clue you into cool freebies from a large set of books, lessons and activities relevant to a given theme. For example, during the Olympics, the site provided a math lesson on calculating skating speeds. For Earth Day, visitors received a free lesson with videos, a lesson plan and activities on climate change debate appropriate for students in grades 6 through 12. [the](#)

Dian Schaffhauser is a senior contributing editor based in Nevada City, CA.

8 Great Tools for Classroom Presentations

Teachers are pairing hardware and software to create lessons that engage students and inspire collaboration.

Creating classroom presentations that keep students engaged and on task is getting complicated for K-12 teachers, who have to rise above myriad distractions to get their points across. Fortunately, there are a number of hardware and software tools available that can help teachers break through the distractions and effectively engage students in class. Here, educators share eight presentation tools that they're using successfully in their 21st century classrooms.

Board Builder

Described by its maker as a “modern day poster board,” [Discovery Education's Board Builder](#) is a digital platform (similar to [Glogster](#)) that lets teachers select backgrounds, text formats, templates and color schemes. Students can customize their collection of resources, tell their own stories and upload their own images, videos and documents to personalize their boards. Second-grade teacher Cheryl Lykowski uses the presentation tool with her [Monroe Road Elemen-](#)

[tary](#) class in Lambertville, MI. By combining her classroom [Smart Board](#) and [Board Builder](#), Lykowski can upload short video clips, reading materials and graphics showing the various components of a mountain or elements of common land plains. “It’s a nice, easy and tidy package,” said Lykowski, “that helps me tie everything together on a single platform and present it in a very intuitive and logical way.”

ClickShare

Designed by Barco, [ClickShare](#) is a wireless presentation and collaboration product designed to let multiple users on multiple computers collaborate on a single projector. The solution projects content from a laptop, tablet or smartphone onto a screen with a single click. Students and teachers can use the equipment to share information and ideas to create an ongoing conversation. Since the fall of 2013, [The Charter School](#) of San Diego has been



using ClickShare for screensharing of live television and lectures during student workshops. According to operations administrator Tiffany Yandell, ClickShare lends itself to collaboration because teachers can deliver a lecture and students can handle the related coursework via one

AV & DISPLAY

streamlined process. “Because it’s ‘live’ learning, it really has helped improve student engagement,” said Yandell. “At the same time, students are also learning how to do their own presentations.”

Educreations

An interactive whiteboard app that captures voice and handwriting and allows teachers to produce video lessons that they can then share online, Educreations is another one of Yandell’s favorite presentation tools. “What’s cool about it is that you can record your presentation,” she pointed out. A teacher who is conducting a short one-on-one lesson with a student, for example, can hit “record,” walk the pupil through a problem, record his or her instructions and then save it for later use. “The student can go back and rewind it — kind of like a YouTube video,” Yandell said. “The learning stays with them, they learn at their own pace and they can watch it over and over again. It’s a great tool.”

Read&Write Gold

Texthelp’s literacy software for the desktop, cloud and iPad helps struggling readers and writers, students with learning disabilities and English language learners access the support tools they need in and out of the classroom. At The Glenholme School in Washington, CT, teachers combine their Smart Boards with Read&Write Gold to help the school’s special needs student population graphically organize their writing (by concept, mind map or outline). The software also predicts words and manages text-to-speech for students handling issues like dyslexia. Educational Director Sharon Murphy said, “It’s made our students’ lives much easier, and makes presentations much simpler to develop and get across to students.”

iMapBuilder

An all-in-one mapping software, iMapBuilder allows users to design interactive maps with pinpoints, heat maps,

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routes, zooming and other elements. The maps are viewable on PCs, Macs and mobile devices. Paul LaRue, a high school teacher at **Washington Court House City Schools** (OH), has been using the software with his social studies students. Recently, for example, third-graders from another rural

school in the region collaborated with his high school students (who collaborated with one another in class) to create a map of the surrounding county. The map was later published on the county's travel and tourism website. "It's great to see students take ownership of technology and create some-

thing that actually has a purpose to it," said LaRue.

DyKnow

Collaborative classroom management software for K-12 teachers and administrators, **DyKnow** helps teachers like Kamilah Chajin effectively collaborate and share information with students during short classroom periods. A high school science teacher at **David Posnack Jewish Day School** in Davie, FL, Chajin uses DyKnow in conjunction with her **Epson BrightLink** interactive projector to "cre-

WATCHING TV IN CLASS



VIDEO: In a video made with MaxCases, teacher Mark Hammons shows how to use Apple TV and an iPad as an interactive projector, document camera and more. [See all this month's videos.](#)

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ate a Smart Board out of a traditional whiteboard.” DyKnow opens up like PowerPoint, said Chajin, and allows her to write on her computer (using a special pen) and project the presentation onto the whiteboard. Students receive the information on their laptops or devices, and it’s also saved to a server for later use. “Even students who are home sick can participate and engage in my presentations,” said Chajin.

Epson Document Camera

After winning a free Epson DC-20 document camera last year, Rachel Perkins, a math teacher at Barren County High School in Glasgow, KY, began using it to show geometric constructions, demonstrate proper compass and straight-edge placement and illustrate the various origami folding methods that she uses as a teaching tool in geometry. Perkins said she saves class time by being able to show all students a single

demonstration, adding, “These lessons are hard to get across with a Smart Board or whiteboard, but when my students can see exactly what I’m doing and how my hands and the tools are positioned, it becomes pretty self-explanatory for them.”

Apple TV

A small device that connects via HDMI and WiFi or Ethernet to stream movies, TV shows, sports, music and YouTube videos, Apple TV is typically associated with home television sets and computers. At Asheville School (NC), however, teachers are pairing their Apple TVs with iPads and Smart Boards to create interactive presentations for their students. Varghese Alexander, director of technology and a high school math instructor, says the school’s math and humanities teachers like the wireless aspect of the equipment and how it lets them demonstrate complicated topics using both internal and external sources (such as online videos). Alexander said, “We have one statistics teacher here who uses his Apple TV in every lesson because it allows him to do anything he could do on a computer, only wirelessly on a Smart Board in front of the class.” 

Bridget McCrea is a business and technology writer in Clearwater, FL.

AND INTRODUCING...

Here are three new presentation options to explore:

AVer’s student engagement software system Sphere2 has two different elements: the Sphere2 Document Camera Software (for the teacher’s PC or Mac notebook) and the ClassSend app (for the student’s tablet, notebook or Chromebook). The camera software integrates up to three live video streams (from document cameras, Web cams or TabCam Wireless Streaming devices) and multiple still images. It also allows teachers to send content via WiFi directly to students’ mobile devices. Using ClassSend, students can view, annotate and store lesson content in real time.

With brightness up to 3,100 lumens and an ultrashort throw ratio of 0.28:1, Casio’s new LampFree Ultra Short Throw projector was designed for the education market, where devices that can project content over a very short “throwing” distance are becoming the standard. Weighing less than 13 pounds, Casio’s XJ-UT310WN not only enables projection from data files stored on a USB memory device, but also allows wireless connection to smartphones and computers via WiFi. The projector also lets teachers display content from a mobile device, which can also be used to control presentations, eliminating the need for additional hardware and equipment.

Panasonic’s TH-80LFB70U Interactive LED Display has an 80-inch screen and features high-speed, multitouch interactive capabilities to promote collaboration. Students and teachers can draw and write directly on a document or image on the screen, and wirelessly sync with Windows, Android or iOS devices using the embedded Miracast functionality.



Flipping the Classroom for Special Needs Students

Technology can play a key role in helping students with physical and learning disabilities stay involved in class and at home.

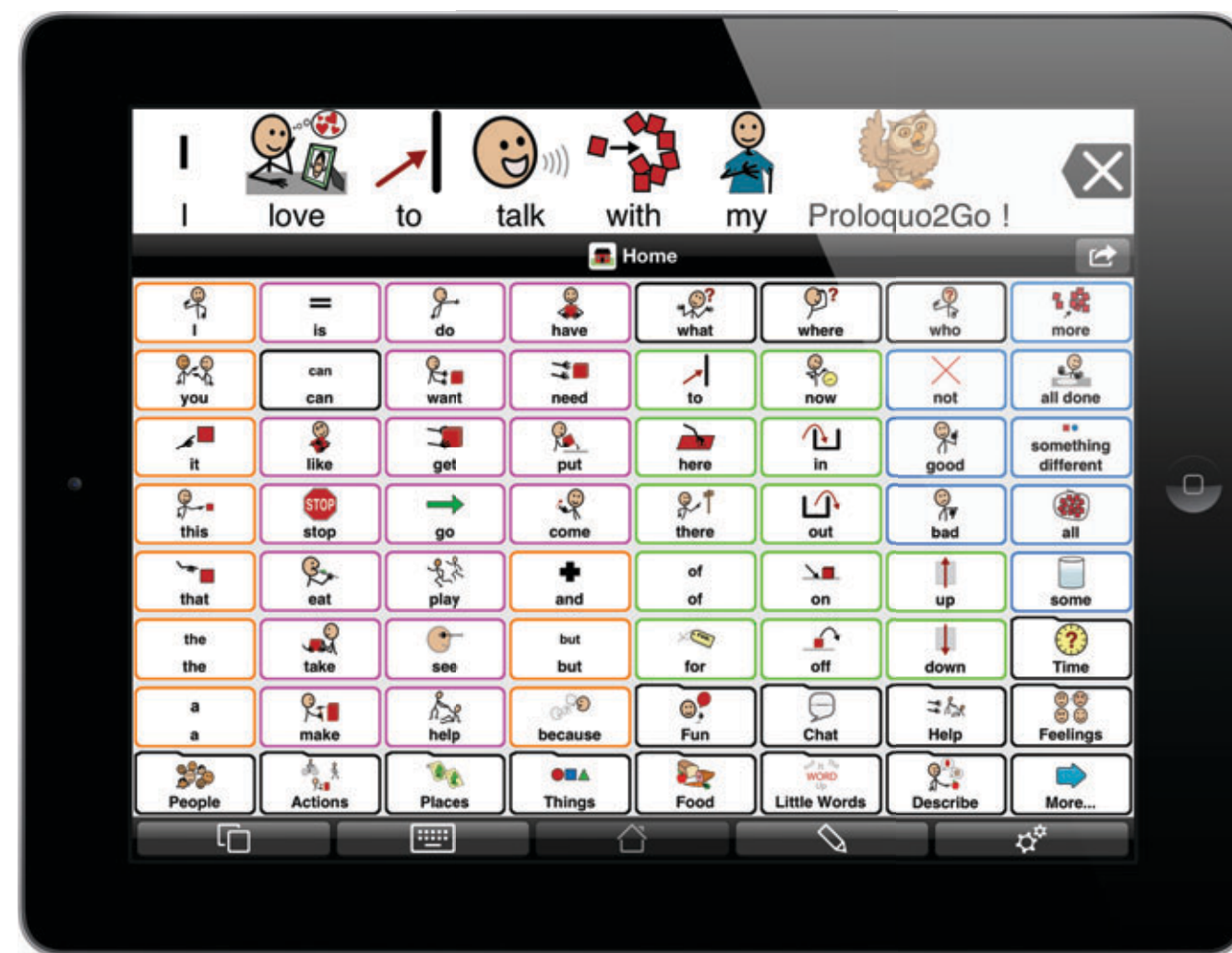
In Cornwall-Lebanon School District (PA), there was a time when students who suffered from severe disabilities and were unable to speak had to use a DynaVox speech communication solution to talk to teachers and collaborate with classmates. The bulky, clunky equipment wasn't portable, said Jason Murray, the district's technology coordinator, which meant that it certainly couldn't play a part in a flipped classroom.

Making the situation even more challenging was the fact that each DynaVox unit cost roughly \$6,000 — a hefty price tag for any public school district struggling to keep up with the newest classroom technology options. “They were both large and expensive,” said Murray, “but at the time, that was all we had to work with.” Fast forward to 2014, and the district has found a more workable solution by combining iPads with the Proloquo2 app, which sells for \$219.99.

According to the developer's website, the app allows students without vocal capabilities to “speak” by tapping buttons that represent words or phrases, access gram-

mar with verb and noun inflections, and transition to literacy with word prediction in “typing” view. And because students use the app on their lightweight, portable devices, they can do their flipped classroom “pre-work” from home and come to class the next day prepared to tackle their lessons.

“Students set up pictures in a matrix format and then, when they touch a picture, the iPad speaks for them,” Murray explained. “By moving over to this technology, we've not only saved money but we've also introduced more mobility and flexibility for our students — both of which are ‘must-haves’ in the flipped learning environment.”



Another tool that Cornwall-Lebanon's teachers use when working with students who have disabilities is Panopto, a video platform used to record, webcast,

ACCESSIBILITY

manage and search. Teachers record their lectures, instructions or other types of content and then upload the videos to the district's LMS. Accessing the content from remote locations — such as their own homes — students can replay the information, watch videos made especially for them and view screen captures and PowerPoint presentations.

According to Murray, “Panopto lets teachers take ownership of the flipped environment by providing

individualized attention to students who are dealing with disadvantages and/or disabilities. The platform supports both audio and video, so depending on the

basis — a tactic she uses to keep her diverse learners engaged and on task.

In addition to the basic classroom tools, Hausser re-

Teacher Melissa Hausser says her biggest challenge is getting middle school students to focus on the lesson at hand rather than the cool tech tools that they're using.

impairment, the software really helps the student work through his or her challenges and learn the material.”

cently began using Zaption to teach both social studies and science. The app, which allows her to create, add elements to, and publish videos, is particularly useful when working with middle-school students who are not reading at grade level. Hausser creates videos that include pop-up quiz questions. Students can then stop the clips, write out their answers and annotate using iPads.

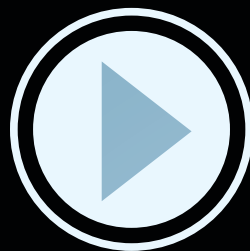
Hausser also uses a document camera to record herself teaching math lessons — completing a worksheet, for example, or walking through a word problem — and then shares those videos with students. Pupils can hit pause, work through the problems and rewind the clips to gain a better understanding of the material. “It’s basically like I’m cloning myself,” Hausser said. “My students get direct instruction and they can stop and go at their own paces. As a result, they get a

Flipping the Switch

Melissa Hausser, a diverse learning teacher at National Teachers Academy in Chicago, is very familiar with the challenges of working with non-traditional students in the flipped classroom. The fact that 90 percent of the school's population is eligible for free or reduced lunch — and as such, doesn't always have access to technology outside of school — makes the flipping the classroom all the more difficult.

To offset these challenges, Hausser teaches in small-group settings of about five students while the remainder of the class uses iPads to watch the lesson from a different center within the physical classroom. All students can interact with Hausser on a rotational

SCHOOLHOUSE ROCK



Nelly
Furtado



VIDEO: An excerpt from a lesson shows how Melissa Hausser uses videos and pop songs to teach her students grammar. [See all this month's videos.](#)

lot more out of the experience than they would from a worksheet.”

When using technology in her flipped classroom, Hausser says her biggest challenge is getting middle

According to Patricia Wright, flipped learning “allows students with autism to benefit from extra preparation time and engage more successfully in social interactions.”

school students to focus on the lesson at hand rather than the cool tech tools that they’re using. To overcome that issue, she’ll sometimes block the Internet and/or camera rolls on her classroom iPads — but she says selfies remain an ongoing obstacle. “For some reason, students want to take a ton of pictures of themselves when they aren’t supposed to,” she said, laughing. “It’s just those little hiccups that you have to work through.”

Assistive Technology Moves Into the Mainstream

Where classroom technology can usually be used by a wide swath of learners, assistive technology for the flipped classroom needs to be more individualized, according to Tracy Gray, managing director for


PowerUp **WHAT WORKS!**, a product of the Center for Technology Implementation. “You really have to look at what works for whom and under what conditions,” said Gray. “We have the technology tools to personal-

ize the instruction, but now we need to focus on the individual needs of students at the rates at which they acquire information and knowledge.”

Gray said that captioning applications, video platforms, text-to-speech software and other assistive technologies have progressed significantly over the last few years and have made the flipped environment more accessible to non-traditional learners. As both Murray and Hausser illustrated, this “bucket” of accessible technologies goes a long way toward supporting students with special needs who don’t always have the luxury of going home, turning on an iPad and absorbing a 10-minute instructional video independently.

Patricia Wright, vice president of professional services for New York-based Rethink, which provides educational treatment solutions for children with autism,

sees the flipped classroom as particularly relevant for autistic students who may require more enrichment and interaction with teachers. She sees video — and a student’s ability to watch, stop and re-watch clips — as a particularly vital technology tool for such environments. “The flipped learning concept also allows students with autism to benefit from that extra preparation time,” said Wright, “and to be able to engage more successfully in those social interactions” than they could in a class where a teacher lectures and students shout out questions and answers.

The rapid advancement of touch technology has also put more power in the non-traditional students’ hands, said Wright, and made the flipped classroom more accessible than it was when highly specialized technology like the DynaVox was the only option. Finally, Wright said that the proliferation of mobile apps is bringing special needs functionality into the mainstream. “Tools that we would have historically called ‘assistive technology’ are now available on iTunes,” said Wright. “As more of this technology bleeds into the commercial realm, it’s making the flipped classroom even more accessible.” 

Bridget McCrea is a business and technology writer in Clearwater, FL.



Ed Tech: What's the Use?

The history of educational technology is a reminder that it's not the machine that matters — it's finding the tool that best serves your educational objective.

In June 1997, *THE Journal* published an article called “*Computers in Education: A Brief History.*” That article is still one of the most popular on our website, but — to put it mildly — a lot has changed in ed tech since then. This is less a sequel to that article than a companion piece that dips back into the past, traces the trends of the present and looks to the future, all with an eye toward helping districts find the right device for their classrooms.

When thinking about the role of technology in education, the logical starting point is exploring why the connection between computers and education was ever made in the first place. My starting point is Logo, an educational programming language designed in 1967

at Bolt Beranek and Newman (BBN) by Danny Bobrow, Wally Feurzeig, MIT professor Seymour Papert and Cynthia Solomon. This language was a derivative of the AI programming language LISP, and ran on the PDP-1 computers from Digital Equipment Corp. Seymour Papert had studied with the constructivist pioneer Jean Piaget, and felt that students could learn more by constructing their own knowledge and understanding by working firsthand with mathematical concepts, as opposed to being taught these concepts in a more directed way.

In 1973 the Xerox Palo Alto Research Center introduced the Alto computer, designed as the world's first personal computer. At Xerox, Papert's push to

turn kids into programmers led to the development of Smalltalk — the first extensible, object-oriented programming language — under the direction of Alan Kay. Because these early computers were captive in the research lab, local students were brought in to explore their own designs.

Another path to educational technology began that same year, when the Minnesota Educational Computing Consortium (MECC) was started in an old warehouse in Minneapolis. Part of the state's educational software push, the original programs were simulations designed for a timeshare system running on a mainframe, with terminals placed in schools. Using this system, students could take a simulated journey



along the Oregon Trail, for example, and learn about the importance of budgeting resources and other challenges that faced the early pioneers. Another simulation let the students run a virtual lemonade stand. Years later, the MECC software was rewritten for early personal computers.

In the early days, educational computing was focused on the development of higher-order thinking skills. Drill-and-practice software only became commonplace much later, with the release of inexpensive personal computers. By the late 1970s, personal computers came to market and started showing up in schools. These included the Commodore PET (1977) and Radio Shack TRS-80 (1977), among many other systems. But the computer that ended up having the greatest impact on schools at the time was the Apple II, also introduced in 1977. It used floppy disks instead of cassette tapes for storing programs and also supported a graphical display, albeit at a low level. The first generation of computers in schools was not accompanied by very much software, though. The customer base was not yet big enough to justify the investment.

The Uses of Ed Tech, Past and Present

In 1980, Robert Taylor wrote a book, *The Computer in the School: Tutor, Tool, Tutee*. The underlying idea in

this book was that students could use computers in three different ways: 1) As a tutor running simulations or math practice, for example; 2) as a tool for tasks like word processing; or 3) as a tutee, meaning the student teaches the computer to do something by writing a program in Logo or BASIC. This model touches on several pedagogical models, spanning from filling the mind with information to kindling the fire of curiosity. Even though technologies have advanced tremendously in the intervening years, this model still has some validity, and some contemporary technologies are better suited for some pedagogies than others.

After decades of desktop and laptop computers, we have added a host of new tools: smartphones, tablets and Chromebooks, to name just a few. The long-time dream of 1-to-1 computing seems to be coming true in schools all over the world, and is even being eclipsed by those who have more than one computing device. For example, I travel with a laptop, tablet, smartphone and Chromebook. While my case may be a bit extreme, many kids have two or three devices in their backpacks.

The problem that arises is when schools or districts decide to choose a single technology for large-scale adoption in a traditional 1-to-1 program. With so many options on the table, the desire to grab hold of the next

shiny thing has pushed some deeper questions into the background. For decades, I have argued that the process of choosing computers for school use needs to be driven by the answers to these questions:

- 1) What is the educational objective?
- 2) What software meets that objective?
- 3) What platform(s) run the desired software?

In other words, educators need to start at the beginning — the things teachers hope to accomplish in schools — and then move to thinking about technology, with software driving hardware selections. There are two reasons that this process is important: First, these tools are expensive and schools need to get as much use out of them as possible. Second, time in the classroom is scarce, and it needs to be used wisely.

Choosing the Right Device

With all the new devices on the market today, choosing just one can appear overwhelming, but there is a process that brings some order to the task. The tool I will use is the SWOT diagram, which lays out strengths, weaknesses, opportunities and threats. SWOT was originally designed for analyzing companies, but it works for our purposes as well.

The basic idea is that there are external forces (strengths and weaknesses) as well as internal forces

RESEARCH

(opportunities and threats) that apply to every technology you're considering for school use. While cost and trendiness are two factors influencing device purchases today, these are really secondary to the core issue: How will these devices be used to improve education in your school or district?

I will provide a brief SWOT analysis for four kinds of computing devices found in schools today, but this analysis is purely for demonstration purposes. Parts of the process are subjective, so you will need to create your own analyses, and not just rely on what I provide. The real power comes when this process happens in a school or district setting and includes teachers, technology coordinators, administrators and, in some cases, students. The devices we will look at include the following: laptops, smartphones, tablets and Chrome-

Laptop Strengths

- Runs a wide variety of software
- Easy to connect to printers and other devices
- Supports all pedagogical models

Weaknesses

- Low battery life
- Heavy
- Can be expensive

Opportunities

- At least some laptop or desktop computer access is required to use 3D and normal classroom printers.
- Laptops are needed for most legacy software.

Threats

- Bad operating system experiences drive people to other platforms.
- 4 to 5% of computer sales in business were Chromebooks in 2013.

books, with the understanding that, as new technologies come to market, the same process should be used with them.

Looking Toward the Future

The world of educational computing devices is far from static. Today's tech community is paying a lot

of attention to wearable technologies, some of which communicate with other tools we might have, like smartphones.

One of the most prominent devices in this new market is Google Glass, which attaches to eyeglasses, accepts voice commands and has a small (but high-resolution) display positioned over one eye. While it is hard to see how this device can address educational needs, it has the advantage of letting the user look forward to see both the real and computer-based world at the same time. Perhaps, for example, while a teacher was giving a presentation on the history of the Middle Ages, students with Google Glass could, while watching the presentation, also be bringing up online resources on the topic.

Smartwatches are also proliferating. These may start out being seen as more of a distraction than as a posi-

Smartphone Strengths

- Highly portable and inexpensive

Weaknesses

- Small screen
- Difficulties in working with text
- Very limiting for some pedagogical models

Opportunities

- Can lead to "phablets" with larger screens
- Still pocket-sized

Threats

- Constant change in phone designs and features
- The need to address multiple platforms in school setting

RESEARCH

tive tool, since they deflect students' eyes and ears from the classroom to a small device that functions as a watch, music player, messaging tool and even as a portal to the Web.

As new wearable technologies are introduced, including bracelets or even "smart" rings, educators are likely to see these devices as distractions from learning, too. This is a logical conclusion for them to reach right now — but it doesn't change the fact that someday, a wearable device might prove to be a hugely useful educational tool.

This all brings us back to the beginning, with the ideas of Seymour Papert and his colleagues who saw computers as tools that students could use to explore rich

Chromebook Strengths

- Long battery life
- "Real" keyboard
- Some applications (such as Google Docs) can run offline.
- Inexpensive
- No viruses
- Easy to transfer content to a different machine

Weaknesses

- Printers are hard to set up.
- Can't run legacy software
- Requires reliable broadband for cloud-based applications

Opportunities


- Rapid growth of educational applications
- Real keyboard and trackpad meets statewide mandates for online testing.
- Chromebooks support multiple pedagogies.

Threats

- While Chromebooks eclipsed netbooks, they may be vulnerable to other competing devices in the future.
- Apple may decide to build a "Safaribook" to compete in this category.

topics through their own constructions. While technologies have advanced tremendously since the 1960s, our pedagogical models have not. With the rise of new standards that support more constructivist models of

education, we can help our students most by applying the old ideas to the new tools, something that most technologies that are being used in schools today are capable of doing.

We make a big mistake when we think the new tools, by themselves, impact learning. The coolest tools are those that let students learn in ways that result in life-long intellectual development. 

David D. Thornburg has worked in the field of educational technology since 1981. He cofounded the Knights of Knowledge, where he creates short videos that provide a driving question to trigger student research on a topic. He also conducts workshops for schools and districts on implementation of the Next Generation Science Standards.

Tablet Strengths

- Long battery life
- Can hold many self-contained applications
- Competition among many vendors means that prices continue to fall as features improve.

Weaknesses

- Mechanical keyboard usually not included
- Designed as a single-user consumer device
- Limited use for some pedagogical models

Opportunities

- Kindle Fire and Samsung tablets provide pressure to reduce price in this category of device.
- Apple's share of the tablet business dropped to 36% in 2013.

Threats

- Other technologies may be superior to tablets in education at the same or lower prices.

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Samsung 10
 samsung.com/education

Sprint 9
 sprint.com/edusave

THE Journal Newsletters..... 22
 thejournal.com/newsletters

THE Journal Subscription..... 16
 thejournal.com/subscribe

SCHOOL INDEX

Asheville School (NC) 23
 Barren County High School (KY) 23
 Beaufort County School District (SC)..... 17
 Charter School of San Diego (CA)..... 20
 City Schools of Decatur (GA)..... 4
 Cornwall-Lebanon School District (PA) 24
 David Posnack Jewish Day School (FL)..... 22
 Drew-Freeman Middle School (MD)..... 19
 Durham Public Schools (NC) 4
 Florida Virtual School 7
 Glenholme School, The (CT) 21

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Halifax Regional School Board (Canada) 4
 Jenison Public Schools (MI)..... 4
 Metropolitan Nashville Public Schools (TN)..... 7
 Monroe Road Elementary School (MI)..... 20
 Nashville Middle College High School (TN)..... 7
 National Teachers Academy (IL) 25
 Nevada City School of the Arts (CA)..... 16
 Northwest High School (TX)..... 15
 Palo Alto Unified School District (CA) 2
 Quakertown Community School District (PA)..... 2
 Rowan-Salisbury School System (NC) 2
 Southwest Allen County Schools (IN) 15-16
 South Woods Elementary School (FL)..... 2
 St. John's County School District (FL) 2
 St. John's Lutheran School (CA)..... 4
 Summit Public Schools (CA) 14
 Union County Public Schools (NC) 3
 Washington Court House City Schools (OH) 22
 West Ridge Middle School (TX) 12

COMPANY INDEX

Absolute Software 6
 Aleratec 6
 Amplify..... 3
 Apple 4, 22, 28, 30
 AVer 23
 Barco 20
 BBN 27
 BoomWriter..... 13
 Casio 23
 Curriculum Associates..... 14
 Discovery Education..... 4, 19-20
 DynaVox 23, 26

Edgenuity..... 6
 Edmodo 12
 eduClipper 18
 Educreations..... 21
 eDynamic Learning 7
 Epson 22-23
 Facebook..... 2
 Glogster 20
 Google 3, 6, 27, 29-30
 instaGrok 17
 Instructure..... 6
 Intel..... 10
 Knowledge by Design..... 14
 Learning Upgrade..... 17
 LearnZillion 17
 Lenovo 3
 MobyMax 17
 Net Texts..... 19
 NextLesson..... 18
 Panasonic..... 22
 Panopto 24-25
 Pearson Education 15, 19
 Pinterest 18
 Prologic..... 6
 Radio Shack 28
 Renaissance Learning..... 12
 Rethink 26
 RJM Strategies..... 10
 Samsung 27, 30
 Smart Technologies 20-22
 Xerox 27
 YouTube 21, 23
 Zaption..... 25

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