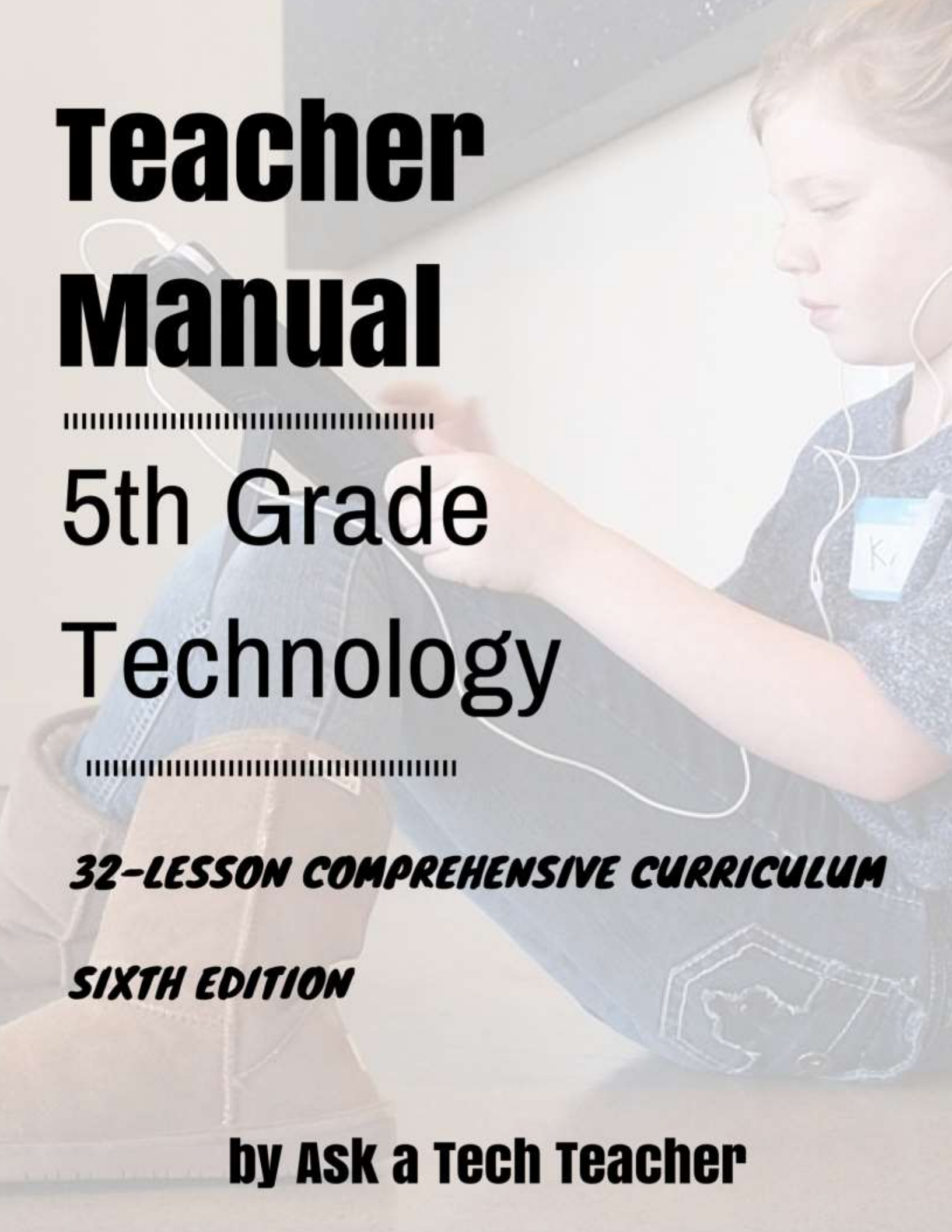

Teacher Manual

5th Grade Technology

32-LESSON COMPREHENSIVE CURRICULUM

SIXTH EDITION

by Ask a Tech Teacher

FIFTH GRADE TECHNOLOGY

A 32-LESSON COMPREHENSIVE CURRICULUM

SIXTH EDITION

Part Six of Nine of the SL Technology Curriculum

Sixth Edition 2016
Visit the companion website at http://askatechteacher.com for more resources to teach technology

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Introduction

The educational paradigm has changed—again. Technology has become granular to learning, blended into educational standards from Kindergarten on, like these rephrased from Common Core:

- *Expect students to demonstrate sufficient command of **keyboarding** to type a minimum of one page [three by sixth grade] in a single sitting*
- *Expect students to **evaluate different media** [print or digital]*
- *Expect students to **gather relevant information** from print and digital sources*
- *Expect students to integrate and evaluate **information presented in diverse media** and formats*
- *Expect students to **interpret information** presented visually, orally, or quantitatively [such as interactive Web pages]*
- *Expect students to make **strategic use of digital media***
- *Expect students to use **glossaries or dictionaries, both print and digital** …*
- *Expect students to use information from **illustrations and words in print or digital** text*
- *Expect students to communicate with a **variety of media***
- *Expect students to **use text features and search tools** (e.g., key words, sidebars, **hyperlinks**) to locate information*

But how is this taught?

With the **Structured Learning Technology Curriculum**. Aligned with Common Core State Standards* and National Educational Technology Standards, and using a time-proven method honed in classrooms, students learn the technology that promotes literacy, critical thinking, problem-solving, and decision-making through project-based work. The purpose is not to teach step-by-step tech skills (like adding borders, formatting a document, and creating a blog). There are many fine books for that. What this curriculum does is guide you in providing the ***right information at the right time***.

Just as most children can't learn to read at two, or write at four, they shouldn't be required to place hands on home row in kindergarten or use the Internet before they understand the digital risks and responsibilities. The Structured Learning curriculum makes sure students get what they need at the right age with proper scaffolding. The end result is a phenomenal amount of learning in a short period of time.

"New technologies have broadened and expanded the role that speaking and listening play in acquiring and sharing knowledge and have tightened their link to other forms of communication. Digital texts confront students with the potential for continually updated content and dynamically changing combinations of words, graphics, images, hyperlinks, and embedded video and audio."

—CCSS

"Use of technology differentiates for student learning styles by providing an alternative method of achieving conceptual understanding, procedural skill and fluency, and applying this knowledge to authentic circumstances."

—CCSS

If there are skills you don't know, visit our Help blog (AskATechTeacher.com) or join the companion wikis:

- *K-3rd grade — http://k-3tech.wikispaces.com/*
- *4th grade — http://fourthgradetech.wikispaces.com/*
- *5th grade — http://5thgradetechclass.wikispaces.com/*

They're free, include videos, and are staffed by teachers who use the curriculum.

What's in the SL Technology Curriculum?

The SL Curriculum is project-based and collaborative, with wide-ranging opportunities for students to show their knowledge in the manner that fits their communication and learning style. Each grade level in the curriculum includes five topics that should be woven into 'most' 21st-century lesson plans:

- *keyboarding—more than typing*
- *digital citizenship—critical with the influx of Chromebooks and iPads*
- *problem-solving—to encourage independence, critical thinking*
- *vocabulary—decode unknown words in any subject quickly with technology*
- *publishing-sharing—to promote collaborative learning*

Here's a quick overview of what is included in the curriculum:

- *curated list of assessments and images*
- *articles that address tech pedagogy*
- *Certificate of Completion for students*
- *curriculum map of skills taught*
- *monthly homework (3rd-8th only)*
- *posters to visually represent topics*
- *Scope and Sequence of skills taught*
- *full lesson on keyboarding, digital citizenship and problem solving (at most grade levels)*
- *step-by-step weekly lessons*

Each weekly lesson includes:

- *assessment strategies*
- *class exit ticket*
- *class warm-up*
- *Common Core Standards*
- *differentiation strategies*
- *educational applications*
- *essential question and big idea*
- *examples, rubrics, images, printables*
- *ISTE Standards*
- *materials required*
- *pedagogic articles (if any)*
- *problem solving for lesson*
- *skills—new and scaffolded*
- *steps to accomplish goals*
- *suggestions to unpack*
- *suggestions based on digital device*
- *supporting links*
- *teacher preparation required*
- *time required to complete*
- *vocabulary used*
- *weekly how-to video (online)*
- *weekly real-time online question sessions*

Throughout the text are links to extend lessons, add enrichment, and/or provide flexibility in your teaching. No PDF? Usually the link is spelled out. If not, Google the name or contact our help site.

Programs Used

Programs used in this curriculum focus on skills that serve the fullness of a student's educational career. Free alternatives are noted where available:

General		2-8	
Web tools	*Drawing program*	*Word processing tools*	*Desktop publisher*
Google Earth	*Image editor*	*Spreadsheet tools*	*Presentation tools*
	Keyboarding tool	*Email program*	

What's New in the Sixth Edition?

A good tech curriculum is aligned with best practices in technology and education. That means it must be updated every few years. Consider the changes to technology in education since SL's Fifth Edition published in 2013:

- *Windows updated its platform—twice.*
- *IPads have been joined by Chromebooks as a common classroom digital device.*
- *There is greater reliance in the classroom on Internet-based tools than software. This underscores the importance of teaching digital citizenship to even the youngest learners.*
- *Student work is often collaborative and shared.*
- *Student work is done anywhere, not just the classroom and home, meaning it must be synced and available across multiple platforms, multiple devices.*
- *Keyboarding skills are often critical, especially to summative year-end testing.*
- *Technology in the classroom is the norm, but teacher training isn't.*
- *Education is focused on college and career with tech an organic, transformative tool.*
- *Teachers have moved from 'sage on the stage' to 'guide on the side'.*
- *Students have been raised on digital devices. They want to use them as learning tools.*
- *Using technology is no longer what 'geeky' students do. It's what all students want to do.*
- *Printing is being replaced with sharing and publishing.*
- *More teachers are willing to try technology when used authentically.*

In response, here are changes you'll find in the Sixth Edition:

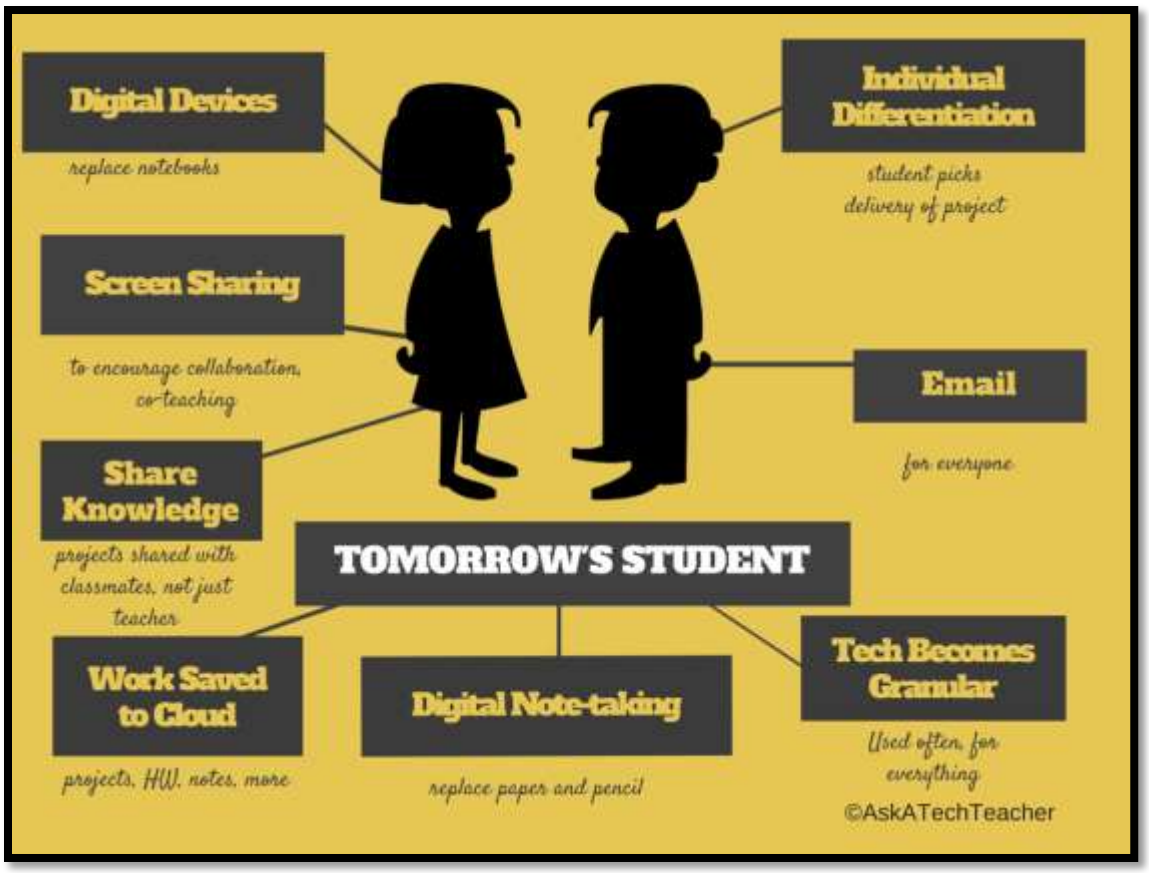
- *The lesson audience is now as likely to be the **grade-level teacher as the tech teacher**. You'll learn how to unpack the lesson regardless of which hat you wear.*
- *Ideas are provided to deliver lessons on all **popular digital devices** including desktop computers, Chromebooks, and iPads.*
- *The importance of **higher order thinking**— analysis, evaluation and synthesis—is called out.*
- *The importance of '**habits of mind'—**critical to college and career goals—is included.*
- *It's easy to recognize which **skills are scaffolded** from earlier lessons and which are new.*
- *Each lesson points out **academic applications** of technology.*
- *Students learn to **understand the process**, not just replicate a skill.*
- ***Collaboration and sharing** is often required.*

- ***Differentiation*** *is encouraged. Teachers learn strategies to meet students where they learn.*
- *Each lesson includes a* ***warm-up and exit ticket****, to assess and reinforce student learning.*
- *A* ***Table of Images*** *and a* ***Table of Assessments*** *are included for easy reference.*
- *Updated* ***Scope and Sequence*** *includes more references to Common Core.*
- ***Curriculum Maps*** *shows which month topics are covered as well as which grade.*
- *Each grade-level curriculum includes* ***student workbooks*** *(sold separately).*
- *Each grade level has a* ***lesson on coding****. These are free-standing and can be moved to any spot in the curriculum—like December for Hour of Code.*

Who Needs This Book

You are the Tech Specialist, Coordinator for Instructional Technology, IT Coordinator, Technology Facilitator or Director, Curriculum Specialist, or tech teacher—tasked with finding the right project for a classroom. You have a limited budget, less software, and the drive to do it right no matter roadblocks.

Figure 1—Tomorrow's student



Or you are the classroom teacher, a tech enthusiast with a goal this year—and this time you mean it—to integrate the wonders of technology into lessons. You've seen it work. Others in your PLN are doing it. And significantly, you want to comply with Common Core State Standards, ISTE, your state requirements, and/or IB guidelines that weave technology into the fabric of inquiry.

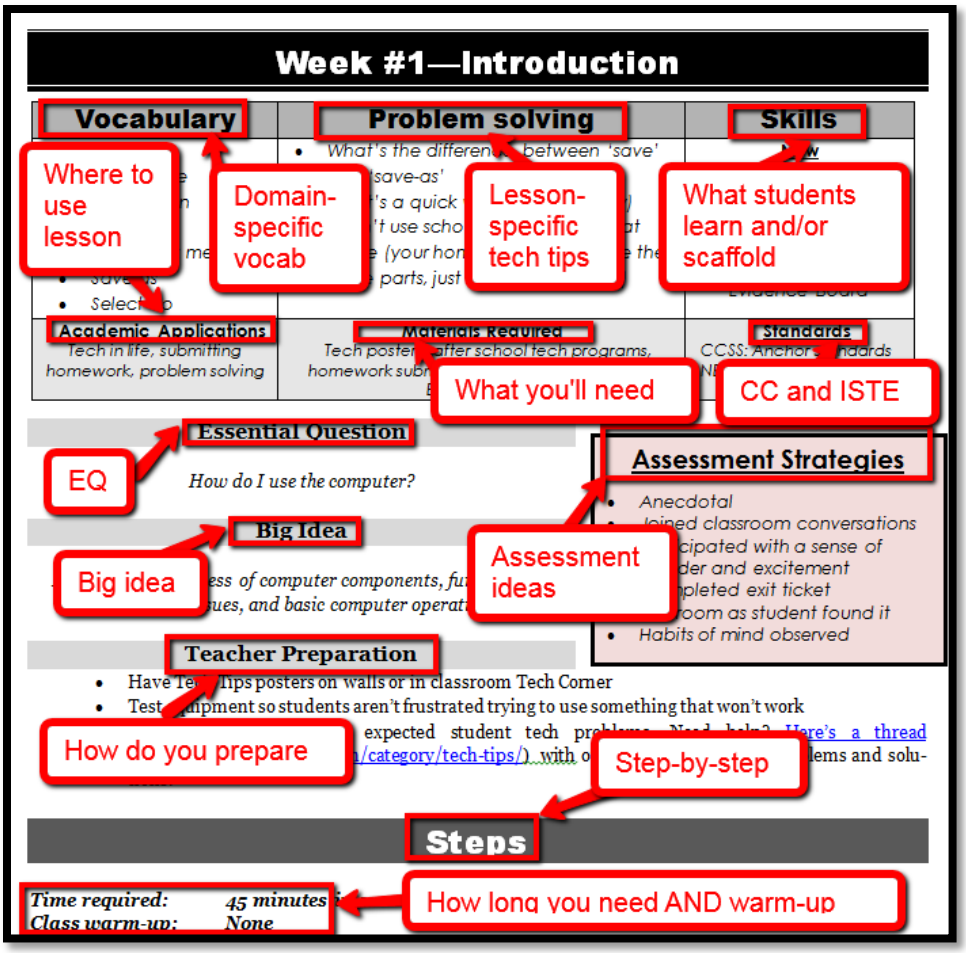
You are a homeschooler. Even though you're not comfortable with technology, you know your children must be. You are committed to providing the tools s/he needs to succeed. Just as important: Your child WANTS to learn with these tools!

How do you reach your goal? With this curriculum. Teaching children to strategically and safely use technology is a vital part of being a functional member of society—and should be part of every school's curriculum. If not you (the teacher), who will do this? To build **Tomorrow's Student** (*Figure 1*) requires integration of technology and learning. We show you how.

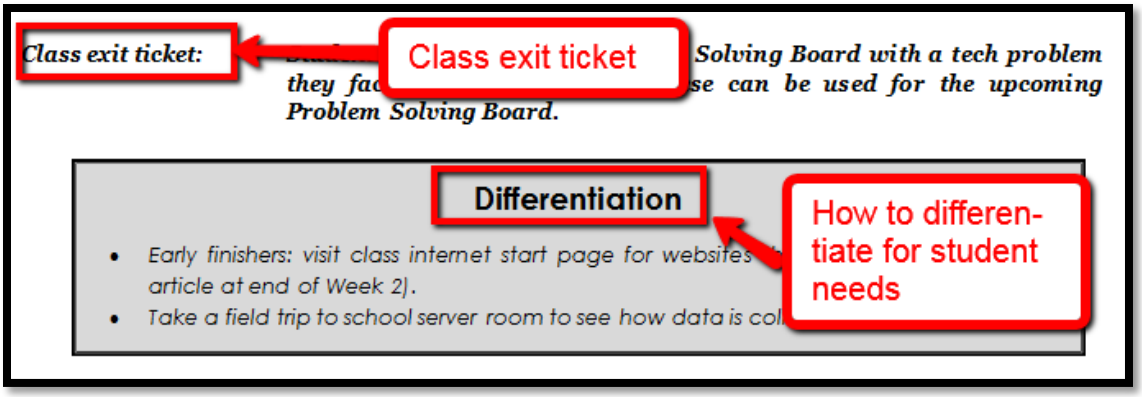
How to Use This Book

Figure 2a shows what's at the beginning of each lesson. *Figure 2b* shows what you'll find at the end:

Figure 2a-b—What's in each lesson?



- *Academic Applications*
- *Assessment Strategies*
- *Big Idea*
- *Class Warm-up*
- *Essential Question*
- *Material Required*
- *Problem solving*
- *Skills*
- *Standards*
- *Steps*
- *Teacher Prep*
- *Time Required*
- *Vocabulary*



- *Class differentiation strategies*
- *Class exit ticket*

The curriculum map in *Figure 3* shows what's covered in which grade. Where units are taught multiple years, teaching reflects increasingly less scaffolding and more student direction.

Figure 3—Curriculum Map—K-8

	Mouse Skills	Vocabulary - Hardware	Problem-solving	Platform	Keyboard	WP	Slide-shows	DTP	Spread-sheet	Google Earth	Search/ Research	Graphics/	Co-ding	WWW	Games	Dig Cit
K	☺	☺	☺	☺	☺					☺		☺	☺	☺		☺
1	☺	☺	☺	☺	☺	☺	☺	☺	☺	☺		☺	☺	☺		☺
2		☺	☺	☺	☺	☺	☺	☺	☺	☺		☺	☺	☺		☺
3		☺	☺	☺	☺	☺	☺	☺	☺	☺	☺	☺	☺	☺		☺
4		☺	☺		☺	☺	☺	☺	☺	☺	☺	☺	☺	☺		☺
5		☺	☺		☺	☺		☺	☺	☺	☺	☺	☺	☺		☺
6		☺	☺	☺	☺	☺	☺	☺	☺	☺	☺	☺	☺	☺		☺
7		☺	☺	☺	☺	☺			☺	☺	☺	☺	☺	☺	☺	☺
8		☺	☺	☺	☺	☺			☺	☺	☺	☺	☺	☺	☺	☺

If you're the grade-level teacher, here's how to use the map:

- Determine what skills were covered earlier years. Expect students to transfer that knowledge to this new school year.
- Review the topics and skills, but don't expect to teach.
- If there are skills listed as covered prior years, confirm that was done. If they weren't (for whatever reason), when you reach lessons that require the skills, plan extra time.

Figure 4 is a month-by-month curriculum map for this grade level. In the student workbook, students complete this themselves or as a group when they finish each lesson.

Figure 4—Curriculum Map—5th grade, month-to-month

	Sept *Wk1-4*	**Oct** *Wk5-8*	**Nov** *Wk9-12*	**Dec** *Wk13-16*	**Jan** *Wk17-20*	**Feb** *Wk21-24*	**March** *Wk25-28*	**April** *Wk29-32*
Blogs	x			x		x		
Class mgmt tools	x							
Coding/Programming		x						x
Collaboration						x	x	x
Communication	x							x
Computer etiquette	x							x
Critical thinking	x			x	x			x
DTP			x	x				x
Digital Citizenship	x							x
Google Earth						x		x
Graphics						x	x	x
Internet			x			x		x
Internet privacy	x					x		x
Keyboarding	x	x				x		x
Presentations								x
Problem solving	x	x	x	x	x	x	x	x
Publishing/sharing	x							x
Research			x					x
Spreadsheets					x			x
Visual learning		x	x	x	x			x
Vocabulary	x	x	x	x	x	x	x	x
Webtools	x	x				x		x
Word Processing	x	x				x		x

Some topics are covered every month. The strategy: spiral and scaffold learning until it's habit.

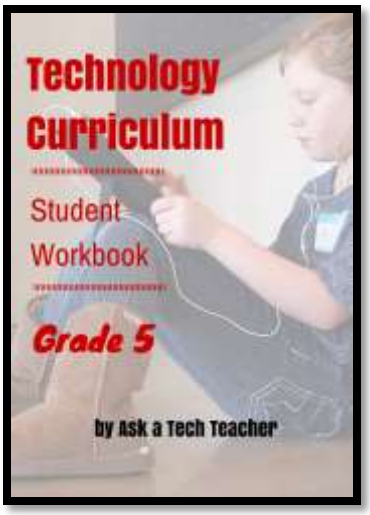
You can use this curriculum on its own—a manual for teaching technology—or in conjunction with the companion student workbooks (http://bit.ly/1M0hFix) (sold separately) and teacher videos (http://bit.ly/1VQGMbY) (free through companion wikis). Once you've selected the program that works best for you, contact Zeke Rowe at admin@structuredlearning.net for free start-up training.

If there is a skill students don't get, circle back on it, especially when you see it come up a second or third time through the course of the K-8 curricula. By the end of 8th grade, students have a well-rounded tech toolkit that serves their learning needs and prepares them for college and/or career.

Here are hints on using this curriculum:

- Join the free grade-level companion wiki (websites listed earlier in this Introduction—grades K-5 only). Difficulty? Email askatechteacher@gmail.com for a Join Code. Here, you get weekly videos on how to teach the lessons and free mentoring via our Office Hours Google Hangouts.
- Invest in student digital workbooks (sold separately — http://bit.ly/1FVU6Sm), a student-centric companion to the teacher guide. Here are suggestions on use:
    - *Full-color projects are at student fingertips complete with examples and directions (licensing varies depending upon the plan).*
    - *Embedded links enable students to click and go—no searching for the site, typing in addresses, or suffering through spelling errors.*
    - *Workbooks can be viewed and annotated through a reader.*
    - *Students can work at their own pace.*

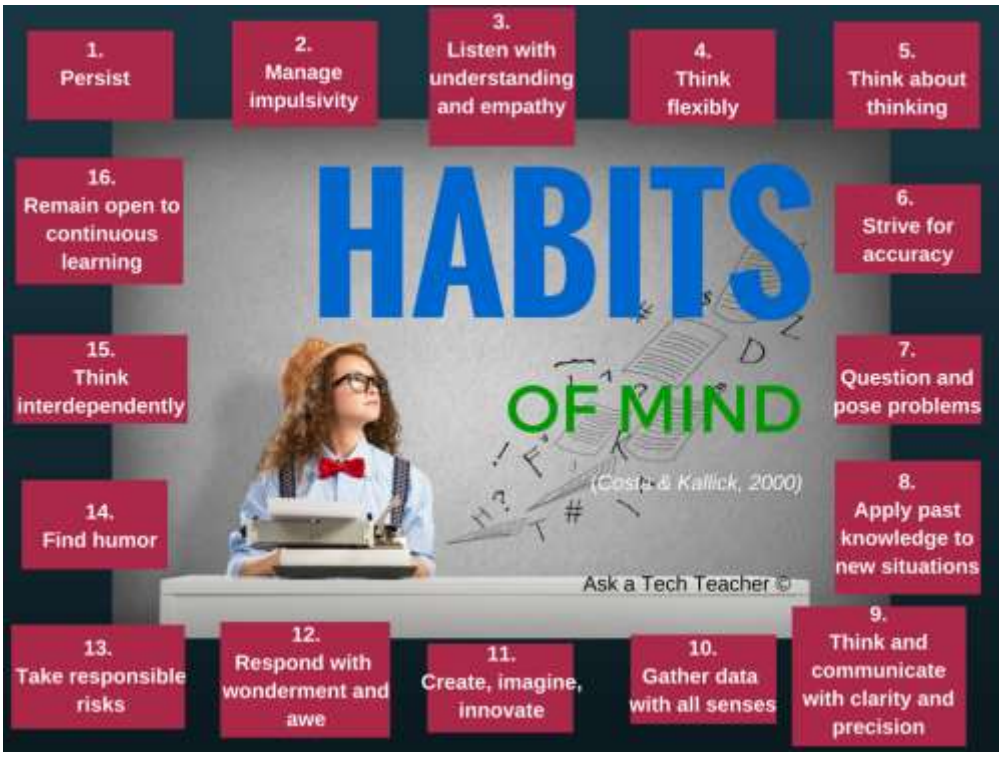
Figure 5--Student workbooks



- Teach lessons in the order presented in the book (grades K-5). Lessons introduce, reinforce, and circle back on skills and concepts. Certain skills scaffold others so you want them solid before moving on. Resist the urge to mix up lessons, even if your perfect time for a particular project comes earlier/later than placement in the book. **One exception: Coding/Programming**. Unpack this lesson when it works best for you.
- Don't expect to get through all of these lessons the first time you teach the curriculum. Lessons rely on scaffolded knowledge from prior years. Until students have built that foundation, they will move more slowly through assigned activities. Adapt each lesson for the skill level of your student group. As they become more accomplished, expect more out of them.
- Some lessons are to be taught throughout the year, circling back often on content. These include keyboarding, digital citizenship, and problem solving.
- Personalize the skills taught in each lesson to your needs with 'Academic Applications'. These are suggestions for blending learning into your school curriculum.
- Each lesson starts with a warm-up to get students back into tech and give you time to finish up a previous class. This is especially useful to the tech teacher and the LMS.
- Some lessons offer several activities that will meet goals outlined in the Essential Question and Big Idea. Pick the activity (or activities) that work well for your student group. Alternatively, you can let students pick the one they like best.
- Each class includes an Exit Ticket to wrap up learning.
- 'Teacher Preparation' often includes chatting with the grade-level team. Why?
    - *tie tech into their inquiry*
    - *offer websites for early-finishers that address their topics*
- Check off completed items on the line preceding the activity so you know what to get back to when you have time. If you have the ebook, use iAnnotate, Goodreader, Subtext, Notable (Google for websites), or another annotation tool that works for your devices.
- Lessons expect students to develop 'habits of mind'. You can read more about Art Costa and Bena Kallick's discussion of these principles at http://habitsofmind.org, in *Figure* 6, and in the ar-

ticle at the end of Lesson #1. In a sentence: Habits of Mind ask students to engage in their learning, not simply memorize.

Figure 6—Habits of Mind



- Sometimes the class is too excited about what they're learning to move on. Take an extra week. Most schools run 35-40 weeks. This book includes 32 lessons.
- If a link doesn't work, copy-paste the address into your Internet browser. A note: Links die. If a link doesn't work even after copy-pasting, email us. We may have a work-around.
- If there is no link, this means it was already provided or shows up readily in a Google search.
- Consider expecting students to back up their work—as a life habit. This can be onto a flash drive, by emailing the document to themselves, or saving to a secondary location.
- Expect students to be risk takers. Don't rush to solve their problems. Ask them to think how it was done in the past. Focus on problems listed in the lesson, but embrace all that come your way. **This scaffolds critical thinking and troubleshooting when you won't be there to help.**
- Expect students to direct their own learning. You are a 'guide on the side', a facilitator not lecturer. Learning is accomplished by both success and failure. Don't expect free time while students work. Move among them to provide assistance, and observations on their keyboarding, problem-solving, and vocabulary decoding skills.
- Encourage student-directed differentiation. If the Big Idea and Essential Question can be accommodated in other ways, embrace those.
- If you need resources on specific topics, click for websites (http://askatechteacher.com/great-kids-websites/) or apps (http://askatechteacher.com/great-apps/).
- Always use lesson vocabulary. Students gain authentic understanding of word use by your example. A complete glossary of lesson vocabulary can be found in the Companion Wiki. Here, you'll find several hundred easy-to-understand definitions of domain-specific tech words.

- If the poster you want is not in the Appendix, check for a free printable copy here (http://askatechteacher.com/getting-started/free-posters/).

- *indicates video*
- *indicates work with a partner*
- *indicates an article*
- *indicates a topical poster (in the Appendix)*
- *indicates material in student workbooks*

- Use as much technology as possible in your classroom—authentically and agilely. Make it adaptive and native. Encourage students to do the same whether it's a smartphone timing a quiz, a video of activities posted to the class website, or an audio file with student input. If you treat tech as a tool in daily activities, so will students.
- **If you have the digital book, zoom in on posters, rubrics, lessons to enlarge as needed.**
- Every effort has been made to accommodate digital devices. You will often see examples in multiple platforms. If the activity is impossible in a particular digital device (i.e., iPads don't have mouses; software doesn't run in Chromebooks), focus on the **Big Idea and Essential Question**—the skill taught and its application to inquiry. Adapt instructions to the tool you use as you work through the steps.

Figure 7—Compatible digital devices

A desktop PC, iMac, laptop, MacBook, Chromebook, iPad, or smartphone

- Throughout the year, circle back on concepts. It takes five times to get a skill (*Figure 8*)—
  - ***First***: *They barely hear you*
  - ***Second***: *They try it*
  - ***Third***: *They remember it*
  - ***Fourth***: *They use it outside of class*
  - ***Fifth***: *They tell a friend*

- **Need more help?** Go to Ask a Tech Teacher© (http://askatechteacher.com) run by teachers using the curriculum or the grade-level companion wiki. Leave a comment or question. You can also email admin@structuredlearning.net or askatechteacher@gmail.com.

Typical Lesson

Each lesson requires about 45 minutes a week, either in one sitting or spread throughout the week, and can be unpacked:

- *In the grade-level classroom*
- *In the school's tech lab*

Both are covered in each lesson. In general terms, here's how to run a lesson in **the tech lab**:

Figure 8--It takes 5 times...

- Post a **written schedule** for the day on the class screen:
    - *Warm up*
    - *Main activity*
    - *Exit ticket*

  This gives students a visual guideline. Add it to your class blog or website to serve those students who aren't present. Expect students to start with the warm-up when they arrive to class.
- **Warm up about 10 minutes,** often with typing practice.
- Complete student **Board presentations** (grades 3-8).
- If it's the end of a grading period, review skills accomplished with **Scope and Sequence**.
- If starting a **new project, review it**. If in the middle of one, use the balance of class to work towards completion. Monitor, answer questions, and help as needed.
- As often as possible, give **younger students two weeks** to finish a project—one to practice, one to save/export/share/print. This redundancy reinforces new skills and mitigates stress. If it's week two, start with the project and finish with typing so students have ample time to work.
- List age-appropriate websites on class Internet start page that **tie into inquiry** for students who complete the current project. Students know these websites can be used during free time.
- **Class exit ticket** might include lining up in arrays, answering a poll posted on the class screen, or simply have classmates verify that neighbors left their stations as they found it.
- **Use tech wherever possible.** Model what you ask of them.

Here's how to run the lesson in **the grade-level classroom**:

- Take the lesson pieces mentioned above and scatter them throughout the week. For example:
    - ***3-10 minutes for the class warm-up—****at the start of the week*
    - ***10-15 minutes keyboarding practice—****any day*

  - ***10-15 minutes Board presentations—****any day*
  - ***15-35 minutes for the project—****any day*
  - ***2-3 minutes for class exit ticket****—to reinforce learning*

- **Check off accomplished activities** so you know what remains each week.
- In every class, **use tech wherever possible.**

Here are useful pieces to extend this curriculum:

- *Teacher manual—the roadmap. That's this book.*
- *Student workbooks (http://bit.ly/1FVU6Sm)—allow students to be self-paced*
- *Companion videos—preview before lesson. Free with K-5 companion wikis*
- *Digital Citizenship curriculum (http://bit.ly/1JgKioZ)— if this is a school focus (sold separately)*
- *Keyboarding Curriculum (http://bit.ly/1JgKy7t)— if this is a school focus (sold separately)*
- *Class Internet start page—provides a class agenda, themed links, and more.*

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About the Authors

Ask a Tech Teacher *is a group of technology teachers who run an award-winning resource blog. Here they provide free materials, advice, lesson plans, pedagogical conversation, website reviews, and more to all who drop by. The free newsletters and articles help thousands of teachers, homeschoolers, and those serious about finding the best way to maneuver the minefields of technology in education.*

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K-6 TECHNOLOGY SCOPE AND SEQUENCE©

Aligned with ISTE Standards

Check each skill off with I/W/M/C under ''ISTE' as students accomplish it ('ISTE' refers to the ISTE Standard addressed by the skill)

Intentionally deleted

Lesson #1 Introduction

Vocabulary	Problem solving	Skills
• *Back-up* • *Landscape* • *Orientation* • *Portrait* • *Right-click menu* • *Save-as* • *Select-do*	• *What's the difference between 'save' and 'save-as'* • *What's a quick way to ** (shortkey)* • *I don't use school email program at home (your home version will have the same parts, just in different places)* • *I have lots of problems (check PS board)*	**New** *Class rules* *Some posters* **Scaffolded** *Problem solving* *Evidence Board*
Academic Applications *Tech in life, submitting homework, problem solving*	**Materials Required** *posters, after school tech, homework submittal, class rules, Evidence Board, student workbooks (if using)*	**Standards** *CCSS: Anchor standards* *NETS: 6a, 6d*

Essential Question

How do I use technology?

Big Idea

Develop an awareness of components, fundamental hardware issues, and basic operations of school digital device

Teacher Preparation

- Have Tech Tips posters on walls or in class Tech Corner.
- Test equipment so students aren't frustrated trying to use something that won't work.
- Know how to fix basic, expected student tech problems. Need help? Here are (http://askatechteacher.com/category/tech-tips/) over 100 common tech problems and solutions.

Assessment Strategies

- *Anecdotal observation*
- *[tried to] solve own problems*
- *Used good keyboarding habits*
- *Decisions followed class rules*
- *Joined classroom conversations*
- *Participated with a sense of wonder*
- *Completed exit ticket*
- *Left room as student found it*
- *Habits of Mind observed*
- *Engaged in higher order thinking*

Steps

Time required: ***45 minutes in one sitting or spread throughout the week***
Class warm-up: ***None***

_____Before anything else, explain to students what your expectations are for their time with you—what's the ***21t Century Lesson Plan*** (article at end of lesson).

_____Tour classroom. Show students where tech is. Review important posters, i.e., the difference between 'save' and 'save-as', difference between 'backspace' and 'delete', 'save early save often', Mulligan Rule, portrait and landscape, and 'select-do'. See full size examples in Appendix.

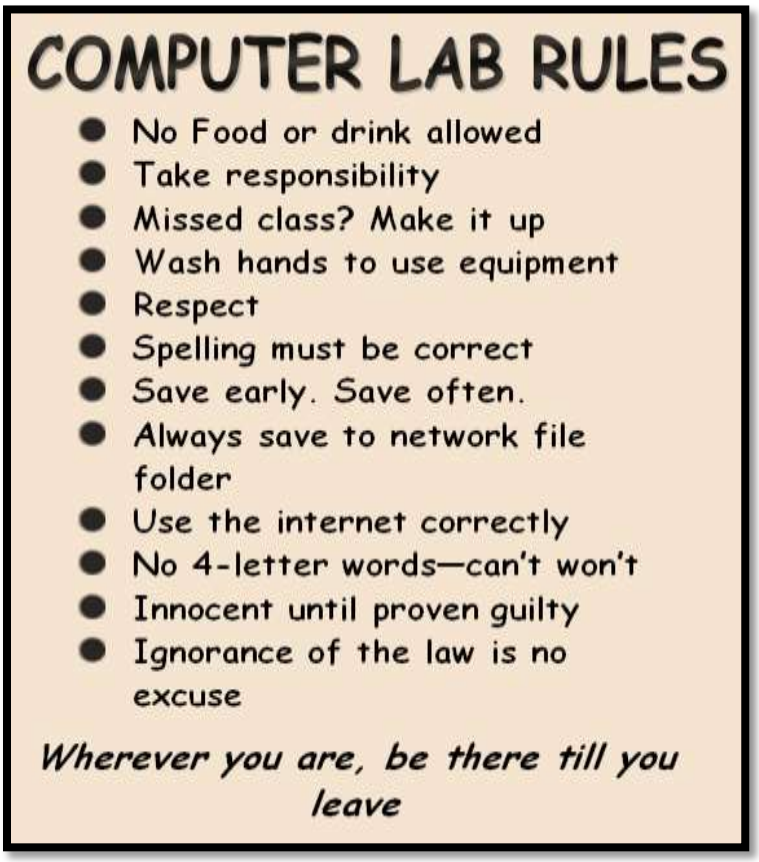
_____Collect rules from students to guide class actions, including:

- *No excuses; don't blame others; don't blame the computer.*
- *Save early, save often—about every ten minutes.*
- *No food or drink around the computer. Period.*

- *Respect the work of others and yourself.*
- *Keep hands to yourself. Feel free to help neighbors, but with words only.*

_____You may start with a list like *Figure 9*, from the prior year, and get student thoughts on updating, amending, and revising.

Figure 9—Technology rules



_____If using workbooks, students can handwrite their suggested rules into the PDF.

_____Make sure this list includes class discussion guidelines such as 1) listening to others, 2) taking turns while speaking, and 3) waiting to be called on before speaking.

_____Let students know that you are open to alternative suggestions on tools to use for a class project. For example, if you suggest Wordle, a student can request Tagxedo. Approval will be granted if the tool fulfills class guidelines. Expect them to use **evidence** to build their case, **compare-contrast** their tool to your suggestions, and **draw logical conclusions**.

_____Offer a **Keyboarding Club** after school two days a week to accommodate students who can't do their homework at home. Limit it to 45 minutes.

_____Offer after-school help on those days for students who need assistance with a tech skill or a project involving tech. Request student volunteers who will assist classmates. You may collaborate with your school's STAR program, where students volunteer for activities as part of class requirements.

_____Review homework policy (homework in the back of this text): due at the end of each month. Students may submit homework via email, a dropbox, or Google Apps (discussed in next unit).

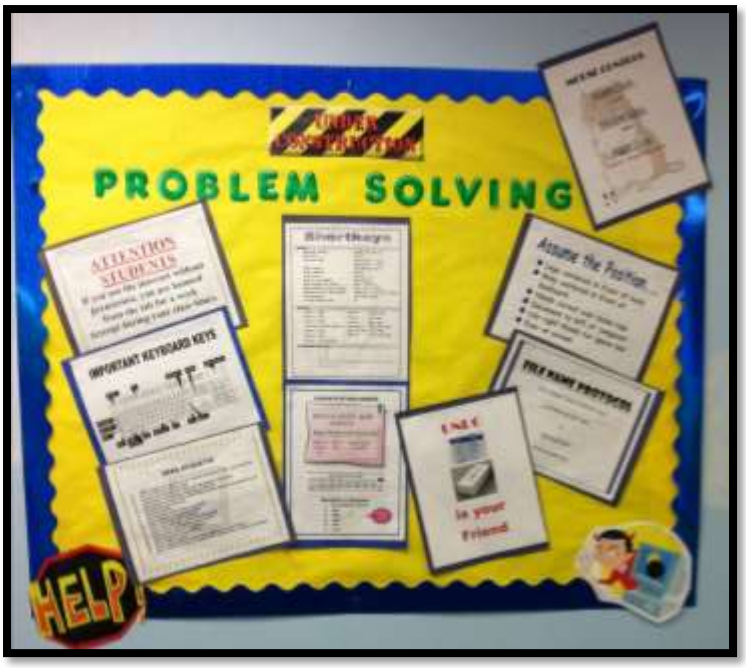
_____Discuss the evidence board (*Figures 10a* and *10b*):

Figure 10a—Evidence Board; 10b—Badge

_____This is a bulletin board that celebrates student transfer of knowledge from tech class to home, friends, or other educational endeavors. About once a month, students will have an opportunity to share how they use tech skills in other classes, at home, or with friends. They will fill out a badge (like *Figure 10b*) and post it on the Evidence Board by their class. By the end of the year, you want this collection to encircle the classroom.

_____Review Problem Solving corner of classroom—a bulletin board where you collect common tech problems students will be expected to solve wherever they use computers (see *Figure 11*). More on this in the Problem-solving lesson.

Figure 11—Problem-solving Board



_____Throughout class, check for understanding.

Class exit ticket: ***Students tack a post-it on Problem-solving Board with a tech problem they faced in the last week. These can be used for the upcoming Problem-solving Board.***

Differentiation

- *Early finishers: visit class internet start page for websites that tie into classwork (see article at end of Lesson 2).*
- *For more on class warm-ups and exit tickets, read* ***"Class Warm-ups and Exit Tickets"*** *at the end of the lesson.*
- *For more on how to build a lesson, read* ***"4 Things Every Teacher Must Teach and How"*** *at end of lesson.*
- *Take a field trip to school server room to see how data is collected and curated.*

Article 1—What is the 21st Century Lesson Plan

What is the 21st Century Lesson Plan?

Technology and the connected world put a fork in the old model of teaching—teacher in front of the class, sage on the stage, students madly taking notes, textbooks opened to a particular chapter being reviewed, homework as worksheets based on the text, tests regurgitating important facts. Did I miss anything? This model is outdated **not because it didn't work** (many statistics show students ranked higher on global testing years ago than they do now), **but because the environment changed.** Our classrooms are more diverse. Students are digital natives, already in the habit of learning via technology. The 'college and career' students are preparing for is different so the education model must be different.

Preparing for this new environment requires radical changes in teacher lesson plans. Here are seventeen concepts you'll want to include in your preparation:

1. Students are graduating from high school unable to work in the jobs that are available. It's the teacher's responsibility to insure students **learn over-arching concepts** such as how to speak to a group, how to listen effectively, how to think critically, and how to solve problems. The vehicle for teaching these ideas is history, science, literature, but they aren't the goal.
2. To focus on the over-arching concepts above, make earning **platform-neutral**. For example, when teaching spreadsheets, make the software or online tools a vehicle for practicing critical thinking, data analysis, and evidence-based learning, not for learning one brand of software or a particular spreadsheet tool. Besides, what you use at school may not be what students have at home. You don't want students to conflate your lessons with 'something done at school'. You want them to apply them to their life.
3. **Morph the purpose from 'knowing' to 'understanding'**. Teach the process, not a skill. Students should understand why they select a particular tool, not just how to use it. Why use PowerPoint instead of a word processing program? Or a spreadsheet instead of a slideshow? Expect students to be critical thinkers, not passive learners.
4. **Transfer of knowledge is critical.** What students learn in one class is applied to all classes (where relevant). For example, *word study* is no longer about memorizing vocabulary, but knowing how to decode unknown academic and domain-specific words using affixes, roots, and context.
5. **Collaboration and sharing** is part of what students learn. They help each other by reviewing and commenting on projects before submittal to the teacher (GAFE makes that easy). The definition of 'project' itself has changed from 'shiny perfect student work' to *review-edit-rewrite-*

submit. You grade them on all four steps, not just the last one. This makes a lot of sense—who gets it right the first time? I rewrote this article at least three times before submitting. Why expect differently from students? **Plus:** No longer do students submit a project that only the teacher sees (and then a few are posted on classroom bulletin boards). Now, it is shared with all classmates, so all benefit from every student's work.

6. **Self-help methods** are provided and you expect students to use them. This includes online dictionaries and thesauruses, how-to videos, and access to teacher assistance outside of class. These are available 24/7 for students, not just during classroom hours. This happens via online videos, taped class sessions, the class website, and downloadable materials so students don't worry that they 'left it in their desk'.
7. **Teachers are transparent** with parents. You let them know what's going on in the classroom, welcome their questions and visits, communicate often via email or blogs when it's convenient for them. That doesn't mean you're on duty around the clock. It means you differentiate for the needs of your parents. Your Admin understands that change by providing extended lunch hours, compensatory time off, or subs when you're fulfilling this responsibility.
8. **Failure is a learning tool.** Assessments aren't about 'getting everything right' but about making progress toward the goal of preparing for life
9. **Differentiation is the norm.** You allow different approaches as long as students achieve the Big Idea or answer the Essential Question. You aren't the only one to come up with these varied approaches—students know what works best for their learning and present it to you as an option.
10. The **textbook is a resource**, supplemented by a panoply of books, primary documents, online sites, experts, Skype chats, and anything else that supports the topic. This information doesn't always agree on a conclusion. Students use habits of mind like critical thinking, deep learning, and evidence-based decisions to decide on the right answers.
11. The **lesson plan changes from the first day to the last**—and that's OK. It is adapted to student needs, interests, and hurdles that arise as it unfolds, while staying true to its essential question and big idea.
12. **Assessment** might include a quiz or test, but it also judges the student's transfer of knowledge from other classes, their tenacity in digging into the topic, their participation in classroom discussions, and more.
13. **Vocabulary is integrated into lessons,** not a stand-alone topic. Students are expected to decode words in class materials that they don't understand by using quickly-accessed online vocabulary tools, or deriving meaning from affixes, roots, and context.
14. **Problem solving is integral** to learning. It's not a stressful event, rather viewed as a life skill. Who doesn't have problems every day that must be solved? Students are expected to attempt a solution using tools at their disposal (such as prior knowledge, classmates, and classroom resources) before asking for help.
15. **Digital citizenship is taught,** modeled and enforced in every lesson, every day, and every classroom. It's no longer something covered in the 'tech lab' because every class has as much

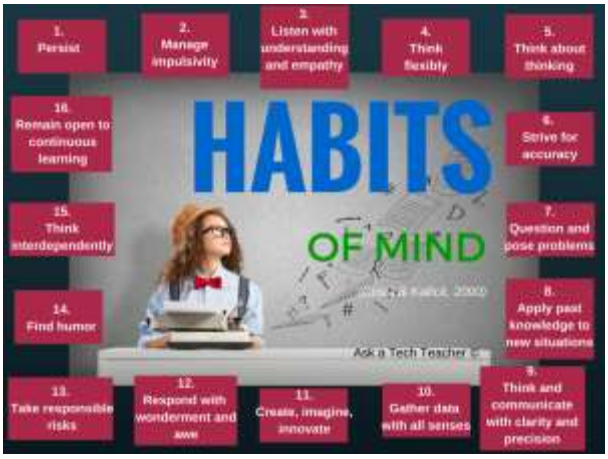
potential for working online as offline. Every time the lesson plan calls for an online tool or research using a search engine or a YouTube video, teacher's review/remind/teach how to visit the online neighborhood safely. It's frightening how students blithely follow weblinks to places most parents wouldn't allow their child to visit in their neighborhood. Just as students have learned how to survive in a physical community of strangers, they must learn to do the same in a digital neighborhood.

16. **Keyboarding skills are granular.** They aren't used only in the computer lab, but in every class students take. If students are using iPads, Chromebooks, laptops, or desktops for learning, they are using keyboarding—which means they must know how to do so efficiently, quickly, and stresslessly. Since keyboarding benefits all classes, all teachers–including the librarian–become partners in this effort. I go into classrooms and show students the broad strokes; the teacher reinforces it every time the student sits down at the computer.
17. **Play is the new teaching.** It is a well-accepted concept for preschoolers and has made a successful leap to the classroom, relabeled as 'gamification'. Use the power of games to draw students into learning and encourage them to build on their own interests. Popular games in the classroom include Minecraft, Mission US, Scratch, and others. If your school is new to this concept, clear it with admin first and be prepared to support your case.

When I first wrote lesson plans, it was all about aligning learning with standards, completing the school's curricula, ticking off required skills. Now, I must build the habits of mind that allow for success in education and home life and construct a personal knowledge base with students that will work for their differentiated needs. Like any lesson plan, this is only difficult the first time. After that, it seems natural.

Article 2—Habits of Mind vs. CC vs. IB

Habits of Mind vs. Common core vs. IB



Pedagogic experts have spent an enormous amount of time attempting to unravel the definition of 'educated'. It used to be the 3 R's—reading, writing, and 'rithmetic. The problem with that metric is that, in the fullness of time, those who excelled in the three areas weren't necessarily the ones who succeeded. As long ago as the early 1900's, Teddy Roosevelt warned:

"C students rule the world."

It's the kids without their nose in a book that notice the world around them, make connections, and learn natively. They excel at activities that aren't the result of a GPA and an Ivy League college. Their motivation is often failure, and taking the wrong path again and again. As Thomas Edison said:

"I have not failed. I've just found 10,000 ways that won't work."

Microsoft founder, Bill Gates, and Albert Einstein are poster children for that approach. Both became change agents in their fields despite following a non-traditional path.

In the face of mounting evidence, education experts accepted a prescriptive fact: student success is not measured by milestones like 'took a foreign language in fifth grade' or 'passed Algebra in high school' but by how s/he thinks. One curated list of cerebral skills that has become an education buzz word is Arthur L. Costa and Bena Kallick's list of sixteen what they call Habits of Mind (Copyright ©2000):

1. *Persisting*
2. *Managing impulsivity*
3. *Listening with Understanding and Empathy*
4. *Thinking Flexibly*
5. *Thinking about Thinking*
6. *Striving for Accuracy*
7. *Questioning and Posing Problems*
8. *Applying Past Knowledge to New Situations*
9. *Thinking and Communicating with Clarity and Precision*
10. *Gathering Data through All Senses*
11. *Creating, Imagining, Innovating*
12. *Responding with Wonderment and Awe*
13. *Taking Responsible Risks*
14. *Finding Humor*
15. *Thinking Interdependently*
16. *Remaining Open to Continuous Learning*

Together, these promote strategic reasoning, insightfulness, perseverance, creativity and craftsmanship.

But they're not new. They share the same goals with at least three other widely-used education systems: 1) Common Core (as close as America gets to national standards), 2) the International Baccalaureate (IB) program (a well-regarded international curriculum, much more popular outside the US than within), and 3) good ol' common sense. Below, I've listed each Habit of Mind with a brief explanation of what that means (in italics). I then point out connections to Common Core, the IB Program, and the common sense your grandma shared with you. The result is a compelling argument that education is less a data download and more a fitness program for our brains.

Persisting

Stick with a problem, even when it's difficult and seems hopeless.

Winston Churchill said, "Never, never, in nothing great or small, large or petty, never give in..." The same decade, Albert Einstein said:

"It's not that I'm so smart, it's just that I stay with problems longer."

The Common Core is not a curriculum, rather a collection of forty-one overarching Standards in reading, writing, language, math, and speaking/listening that shape a student's quest for college and career. Sprinkled throughout are fundamental traits that go beyond the 3R's and delve deeply into the ability of a student to think. The math standards require students learn to 'persevere in solving problems'.

The IB Program has twelve attitudes that are fundamental to every learner: *appreciation, empathy, commitment, enthusiasm, confidence, independence, cooperation, integrity, creativity, respect, curiosity, and tolerance.* Students exhibiting the attitude of commitment persist in their own learning, persevere no matter the difficulties.

Managing Impulsivity

Consider options. Think before speaking.

Among his endless words of wisdom, Benjamin Franklin said:

"It is easier to suppress the first desire than to satisfy all that follow it."

Common Core Standards tell us to 'Use appropriate tools strategically'.

Besides the twelve attitudes listed above, the IB Program names ten traits that profile a learner: *inquirer, knowledgeable, thinker, communicator, principle, open-minded, caring, a risk-taker, balanced, and reflective.* Students who are reflective give thoughtful consideration before acting.

For the rest of the article, click http://wp.me/pZUgb-coJ

Article 3—Class Warm-ups and Exit Tickets

Class Warm-ups and Exit Tickets

Warm-ups are given at the beginning of class to measure what students remember from prior lessons or know about a subject before jumping into a unit. They inform teachers how to optimize time by teaching what students need to learn, not wasting time on what students already know. They are a couple of minutes, can be delivered via a Discussion Board, blog comments, a Google Form, or many other methods. Exit tickets are similar, but assess what students learned **during** the lesson. In this way, teachers know if they should review material, find a different approach to teaching a topic, or students are ready to move on. Like Warm-ups, Exit tickets are a few minutes, and delivered in a wide variety of creative methods.

Here are a few examples:

Polls

Polls are quick ways to assess student understanding of the goal of your daily teaching. It measures student learning as much as lesson effectiveness. Polls are fast—three-five minutes—are anonymously graded and shared immediately with students. It lets everyone know if the big idea of the lesson is understood and if the essential questions have been answered.

These can be graded, but are usually used formatively, to determine organic class knowledge before moving on to other topics.

Tools: Socrative, PollDaddy, Google Forms
Time: a few minutes
Method: Formative assessment

Virtual Wall

Ask students a question and have them add their answer to a virtual wall.

Virtual walls are also great ideas for reviewing a subject prior to a summative assessment. Have each student post an important idea they got from the unit with significant required details.

Tools: Padlet, Linoit
Time: a few minutes
Method: Formative assessment

Article 4—4 Things Every Teacher Must Teach and How

4 Things Every Teacher Must Teach and How

Teaching technology is not sharing a new subject, like Spanish or math. It's exploring an education tool, knowing how to use computers, IPads, the Internet, and other digital devices to serve learning goals. Sure, there are classes that teach MS Word and C++, but for most schools, technology is employed strategically and capably to achieve all colors of education.

Which gets me to the four subjects every teacher must teach, whether s/he's a math teacher, science, literacy, or technology. In today's education world, all of us teach—

- *vocabulary*
- *keyboarding*
- *digital citizenship*
- *research*

They used to be taught in isolation—*Fridays at 8:20, we learn vocabulary*—but not anymore. Now they must be blended into all subjects like ingredients in a cake, the result—college or career for the 21st century student. Four subjects that must be taught—and thanks to technology, CAN be with ease. Let me explain.

Vocabulary

Common Core requires that:

Students constantly build the transferable vocabulary they need to access grade level complex texts. This can be done effectively by spiraling like content in increasingly complex texts.

Does that sound difficult? Think back to how you conquered vocabulary. As an adult, you rarely meet words you can't understand—unless you're chatting with William F. Buckley—and if you do, you decode it by analyzing prefixes, suffixes, roots, context. Failing that, e-dictionaries are available on all digital devices.

Teach your students to do the same:

- first: try to decode the word using affixes, root, context
- second: research meaning

You might think that will grind the academic process to a halt, but truth, in age-appropriate texts, there are likely less than five unknown words per page. What you don't want to do is have students write down words for later investigation. That becomes a chore, cerebral excitement leeched like heat to a night desert sky. Much better to stop, decode, and move on.

As students work on a project in my classes, I see neighbors ask for help with a mysterious word (students are welcome to chat during class about academic topics), screens light up as students use the online dictionary to discover meaning, and words appear on the class screen as part of the backchannel Twitter stream. Seconds later, a definition will appear—someone's contribution. If it's wrong, invariably a student will correct it. Rarely, I jump in.

Don't believe this works? Try it out.

Keyboarding

For years, I taught keyboarding as a separate activity. We warmed up class with 10-15 minutes of keyboarding augmented by 45 minutes a week of keyboard homework. I've revised my thinking. Since keyboarding benefits all classes, I make all teachers—including the librarian—my partners in this effort. I go into classrooms and show students the broad strokes of keyboarding posture, good habits, skills that will enable them to type fast and accurately enough to eventually—maybe third or fourth grade—use the keyboard without slowing down their thinking. That's a big deal and worth repeating—

To be organic, students must be able to keyboard without thinking of their fingers, fast enough that they keep up with their thoughts.

That's about 25 words per minute. *Really?* Yes really. Sure, we think fast, but ruminating over a class question, essay, report is much [much] slower. 25-35 words per minute suffice.

I start students with mouse and keyboard familiarity in kindergarten and 1st grade, introduce the concept of hands and fingers in 2nd, and start speed and accuracy in 3rd. By 5th grade, they're good. This works because now, keyboarding is integrated across all classes, anytime students use a digital device with a keyboard. Now, all teachers pay as much attention to HOW students use the keyboard as WHAT is produced, focusing on:

- good posture
- hands on home row (by 3rd grade)
- elbows at sides
- paper (if using one) to the side of keyboard
- eyes on screen (by 4th grade)
- no flying fingers or hands
- paced rhythm

Parents, too, are my partners. I communicate the same requirements to them with the hope they'll reinforce these at home. A reminder that assessments are often online gets their attention.

Digital Citizenship

It's frightening how much time students spend in an online world they consider safe, following links like blind streets to places most parent wouldn't take their child. Just as students have learned how to survive in a physical community of strangers, they must now learn to do the same in a digital neighborhood. Parents and teachers can't be everywhere, and hiding children from danger doesn't teach them survival skills, so we must teach them how to live in this wild new online world.

Likely, most kindergartners arrive to your classroom familiar with parent smartphones and IPad apps. That means, you start by discussing the 'digital neighborhood', 'stranger danger', 'personal privacy'. Do this every time students use the Internet. Sure, it'll take longer to get to Starfall Math, but students must know the right way to use online sites. Like with keyboarding, make other teachers and parents partners. Let them know what you've taught about digital citizenship and ask them to reinforce it.

Here's the hard part: You must be diligent. Until safe Internet use becomes a habit, you must discuss it every time students cross the threshold of the World Wide Web. There are endless resources—use all of them. Eventually, Internet use will be a safe place to access the innumerable volumes of wonderful resources.

Research

Expect students to use text features and search tools (e.g., key words, sidebars, hyperlinks) to locate information)

I added 'Research' as a fourth blended topic in response to the wealth of misinformation that bombards us daily. It used to be students learned from a trusted textbook that had been vetted and approved over time. Now, textbooks have been replaced with a panoply of books, online sites, experts, Skype chats whose information doesn't always agree. How are students to choose between the opinions of their parents or an astrophysicist who Skyped with the class?

No room for uninformed choosing. Students must research—find truthful, valid information about topics that concern them.

Introduce this concept with a discussion on government. American Democracy thrives on the loud and often messy sharing of diverse opinions. That is to be applauded, not stamped out. But with the demise of trustworthy news interpreters (like the Evening News with Walter Cronkite taken as fact by tens of thousands every evening) comes the rise of primary sources. Thanks to the Internet, finding original documents is doable. Ask students to read, interpret, and share their evidence-based thoughts. No one's right or wrong. We're merely investigating how many shades of 'truth' there are.

There you have it. Four topics that must be included in every lesson. If you covered nothing else but these, you'd have a good year.

Lesson #4 Student Blogs

Vocabulary	Problem solving	Skills
• *Avatars* • *Blog* • *Comments* • *Home row* • *Keyboard shortcut* • *Mulligan Rule* • *Netiquette* • *Post* • *Shortkeys* • *Web log*	• *I don't see my blog post (teacher must approve it)* • *Why can't I use my picture in blog? (discuss digital privacy)* • *Someone made a mean comment (teacher is moderating; it won't show)* • *Can't figure it out (breathe deeply, check screen, you can do it)* • *Log-in didn't work (verify UN and PW before asking teacher for help)*	**New** *Blogging* **Scaffolded** *Speaking and listening* *Problem solving* *Keyboarding* *Digital citizenship*
Academic Applications *Writing, research, collaboration, sharing, publishing, use of evidence, online safety*	**Materials Required** *hardware quiz, keyboard program, blog log-ins, blog posts for student response, Problem Solving Board sign-ups, Evidence Board badges, student workbooks (if using)*	**Standards** *CCSS: W.5.1* *NETS: 6a, 6d*

Essential Question

How do I share with classmates?

Big Idea

Students become aware of how tech enhances educational

Teacher Preparation

- Have Problem-solving Board sign-up sheets.
- Have copies of Blogging Agreement (if necessary).
- Collect words students don't understand for Speak Like a Geek Board presentations.
- Know which tasks weren't completed last week and whether they are necessary to move forward.
- Set up accounts in Kidblog or other blogging program.
- Remind students to bring science book next week.
- Talk with grade-level team so you tie into conversations.
- Ask about tech problems students are having difficulty with. Cover them during tech lessons.
- Ensure that all required links are on student computers.
- Be prepared to integrate domain-specific tech vocabulary into lesson.
- Know whether you need extra time to complete this lesson with your student group.

Assessment Strategies

- *Completed hardware quiz*
- *Annotated workbook (if using)*
- *Signed up for Board*
- *Completed blog assignments*
- *Worked independently*
- *Used good keyboarding habits*
- *Completed warm-up, exit ticket*
- *Joined classroom conversations*
- *[tried to] solve own problems*
- *Decisions followed class rules*
- *Left room as s/he found it*
- *Higher order thinking: analysis, evaluation, synthesis*
- *Habits of mind observed*

Steps

Time required: ***45 minutes in one sitting or spread throughout the week with a block of 30 minutes for blogging***

Class warm-up: ***Keyboarding homerow on class typing program***

_____Start Hardware Assessment. Give students 5-10 minutes. Remind them spelling counts. Remind them if they are unhappy with their score, they can retake for full credit. This is called the **Mulligan Rule**, taken from golf. It's always interesting to see which students understand this 'do over'. See poster in Appendix.

_____When students finish the hardware assessment, return to keyboarding using Dance Mat Typing (http://bbc.in/1uoOKff), Popcorn Typing (http://bit.ly/1JCrscO), or another online site that **focuses on one row at a time** while the rest of the class finishes. Students used these last year so should be able to begin independently.

_____Turn music on to establish a typing rhythm for students. Encourage them to type with the beat.

_____While keyboarding, sign up for Problem-solving Board—starts next week. Remember 3rd and 4th grade? This is the first of three Presentation Boards this year:

- *Post sign-up sheets by the class door where they're easily found. Include slips of paper (Figure 28) that students can track important information. If students have workbooks, fill in the form in it with their annotation tool:*

Figure 12—Info for Problem-solving Board

My name:_____

My question: _____

My presentation date: _____

- *Alternatively, have sign-ups online where they can be shared through:*
  - *GAFE (Google Apps for Education)—either the Calendar or Spreadsheets*
  - *Office 365*
  - *Padlet (using calendar template)— http://padlet.com/*
  - *SignUp Genius— http://www.signupgenius.com*
  - *Appointment Slots in Google Calendar that you shared with students. For a how-to video, visit Ask the Gooru (http://bit.ly/1DpWDab)*

- *Each student signs up for a date to present.*
- *Each student selects a unique problem they will teach classmates to solve.*
- *Students get solution from family, friends, or even teacher as a last resort.*
- *Presentation date: Students tell classmates problem, how to solve it, take questions.*
- *Entire presentation takes about three minutes.*
- *Review grading.*

_____Students may sign up in groups, as long as there is one problem per group member.

_____Load a digital copy of the Presentation assessment (*Assessment 8*) for each student onto your iPad and then use an annotation tool like iAnnotate or Adobe Reader to assess.

Assessment 1—Problem-solving Board rubric

PROBLEM SOLVING BOARD

Grading Rubric

Name: _____

Class: _____

Knew question	_____
Knew answer	_____
Asked audience for help if didn't know answer	_____
No umm's, stutters	_____
Look audience in eye	_____
No nervous movements (giggles, wiggles, etc.)	_____
No nervous noises (giggles,)	_____
Overall	_____

_____*Figure 29* is an example of the types of problems you may include:

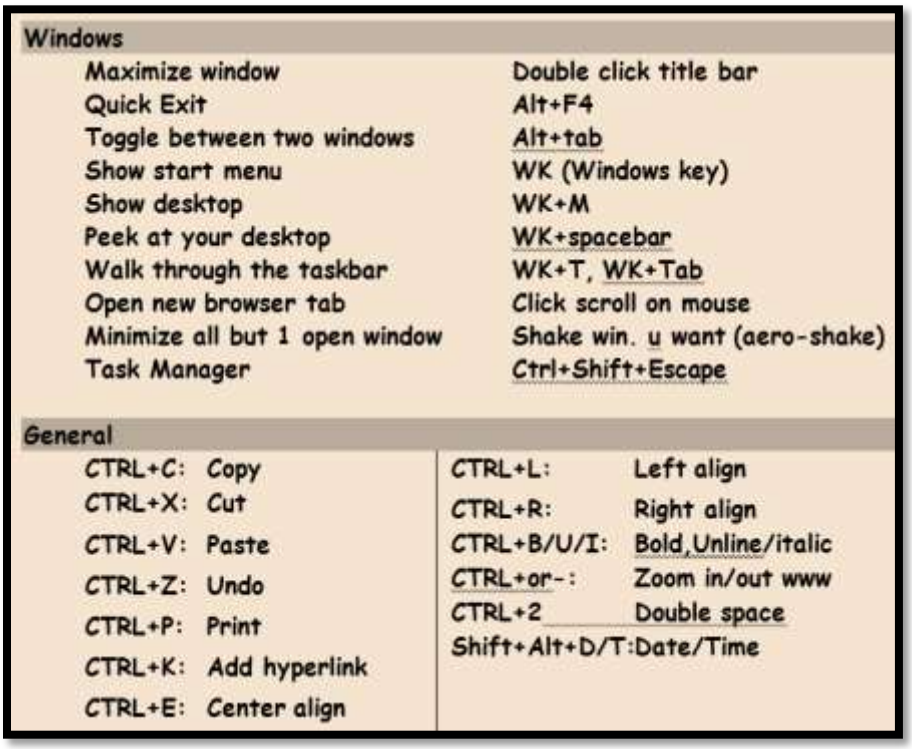
Figure 13—Common computer problems

Common Computer Problems	
What if the double-click doesn't work	What is protocol for email subject line
What if the monitor doesn't work	What does 'CC' mean in an email
What if the volume doesn't work	How do I exit a screen I'm stuck in
What if the computer doesn't work	How do I double space in Word
What if the mouse doesn't work	How do I add a footer in Word
What's the right-mouse button for?	How do I add a watermark in Word
What keyboard shortcut closes program	How do I make a macro in Word
How do I move between cells/boxes?	How do I add a border in Word
How do I figure out today's date?	How do I add a hyperlink in Word
What if the capital doesn't work	Keyboard shortcuts for B, I, U
What if my toolbar disappears	What if the program disappears
What if the document disappears	What if the program freezes
Keyboard shortcut for 'undo'	What is the protocol for saving a file
How do I search for a file	

_____A little background: Problem-solving Board covers tech issues faced during class, as they happen. As you move through the year, collate a list of problems for next year's Board. Start with the problems students suggested as a class exit ticket after Week #1. Include problems students had with tech in homework, at home as they used tech for a school assignment, or problems they had with classroom computers.

_____Include shortkeys like *Figure 30*:

Figure 14—Common shortkeys



_____Problem solving will be addressed in more detail in the ***Problem-solving*** lesson.

_____All Board presentations in this curriculum are independent investigation, risk-taking for cautious students who feel a Right Answer lives out there somewhere. They also provide an authentic method of practicing presentation skills discussed in Common Core under 'Speaking and Listening'.

_____When all students are signed up, review speed quiz results.

_____Any evidence of learning to post on Evidence Board?

_____Introduce the concept of 'blogging'—short articles published online, enhanced with images or videos, with the express purpose of sharing ideas and garnering feedback. In the case of 5th graders, you are particularly interested in their facility to:

- *engage effectively in collaborative discussions with diverse partners*
- *build on others' ideas*
- *express their own ideas clearly*

_____Blogging provides this opportunity.

_____Review the article at lesson end on ***"13 Ways Blogs Teach Common Core".***

_____Before beginning, students must sign an agreement similar to *Fifth Grade Blogging Rules (Assessment 9*). Ask them to discuss the agreement with parents and bring it to school before the next class. If you're using workbooks, students can sign the copy in there, take a screenshot, and email that to you.

_____Students can create blogs in Edublogs, Class Blogmeister, Blogger (latter comes with GAFE)—Google for addresses. Teacher sets up class account. It can be public or private, the

latter providing a safe, walled garden for students to share information and comment on each other's work.

_____Students use blogs for reflection, sharing digital tools (like Vokis, Animotos), posting and sharing Google Docs (through embed feature), collaborating on work, commenting on projects of classmates, and more.

_____Before beginning, circle back on discussions about Internet privacy, and digital rights and responsibilities. This is covered in more detail in the lessons on **Internet Search**.

_____Students can create a profile picture with an avatar creator *like Figure 31* (click for link, Google for address, or use your favorite):

Figure 15--Avatar

- *Monster yourself*
  http://www.thirteen.org/artopia/play.html
- *Animal yourself*
  http://www.buildyourwildself.com/
- *Voki yourself*
  http://voki.com/

_____Follow good digital citizenship habits: Make the avatar look nothing like the student!

_____These can be used in student blogs or other digital platforms that require a profile picture.

_____While blogging, students will:

- *follow agreed-upon blogging rules (see this list http://www.scholastic.com/browse/article.jsp?id=3749958)*
- *write articles based on evidence from a variety of resources*
- *contribute to discussion and/or elaborate on others' remarks by adding comments to the posts of classmates*

_____Studies show blogs (i.e., *Figure 32*) 1) attract a wider audience than traditional reading venues, 2) improve student writing skills by making it fun and hip, 3) incorporate discovery into education, and 4) draw learners into self-guided discussions. Blogs require critical thinking and give content ownership to students.

Figure 16--Student blog

_____Here are other skills students learn from blogging:

- *how to protect privacy*
- *about their Digital Footprint*
- *how to embed information*

_____Discuss blogging netiquette—like email etiquette:

- *be polite*
- *use good grammar and spelling*
- *don't write anything everyone shouldn't read (school blogs are private, but get students used to the oxymoron of privacy and the Internet)*

_____Students sign onto their blog account.

_____Start by showing students your blog. Have several entries that tie into class inquiry. Ask students to select an entry and post a comment. Continue this over a period of several days. Encourage students to respond to classmates with supportive and positive comments.

_____Next, students post a blog about themselves. Only provide information they are comfortable sharing. Include images, video, or music. Make this self-directed as you encourage students to explore widgets and tools available on blog.

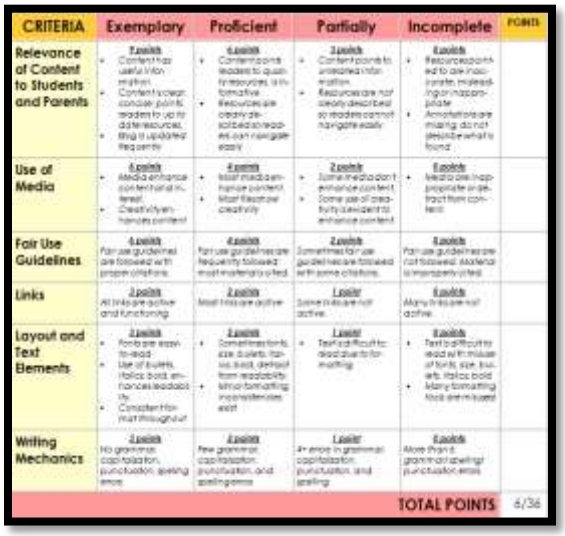
_____Remind students to practice good keyboarding as they type the entry.

_____Once a month, have students post an article that discusses an inquiry topic. Additionally, students should visit and comment on five classmate blogs.

_____Student comments aren't always appropriate? Set account so you approve comments before they go live. And, chat with students about how supportive comments contribute to the conversation.

_____Occasionally throughout the year, use the Student Blogs Rubric *(Figure 33* and *Assessment 10)* to assess student progress.

Figure 17--Blogging rubric



CRITERIA	Exemplary	Proficient	Partially	Incomplete	POINTS
Relevance of Content to Students and Parents	5 points	4 points	3 points	2 points	
Use of Media	4 points	4 points	2 points	0 points	
Fair Use Guidelines	4 points	4 points	2 points	0 points	
Links	2 points	2 points	1 point	0 points	
Layout and Text Elements	2 points	2 points	1 point	0 points	
Writing Mechanics	2 points	2 points	1 point	0 points	
				TOTAL POINTS	6/36

_____How students access their blog will be slightly different if they use a computer (PC, Mac, even a Chromebook) or an iPad. IPad's will access the blog via an app, which often has different steps to accomplish a goal and often has different skills available than computers or Chromebooks. Accommodate instructions for which digital device students are using.

_____If you teach in a lab, have a student post a reminder on the class calendar to bring the science book next week for a lesson on outlining.

_____Remind students to transfer knowledge to classroom or home.

Class exit ticket: ***Have students email you their Problem-solving Board date and question.***

Differentiation

- *Add Important Keys quiz (next week) to calendar.*
- *Have students label each computer part on assessment as 'input' or 'output'.*
- *If homework is due, make sure it's added to class calendar.*
- *Early finishers: visit class internet start page for websites that tie into classwork. Add an after-school blogging group to help students get started. Ask Middle School students to help out.*
- *Consider letting students work in groups as they build their class blog.*
- *If you don't have student blogs, replace with 4th Grade Lesson #4 Book Reviews by the Characters in curriculum extendors (http://www.structuredlearning.net/book/k-6-curriculum-extender/).*
- *If you don't have student blogs, replace this lesson with 4th Grade Lesson #5 IPads 101 in curriculum extendors (http://www.structuredlearning.net/book/k-6-curriculum-extender/).*
- *If you don't have student blogs, replace this lesson with 5th Grade Lesson #1 Scratch in curriculum extendors (http://www.structuredlearning.net/book/k-6-curriculum-extender/).*

Assessment 2—Student blogging agreement

Fifth Grade Blogging Rules
(adapted from Academy of Discovery wiki)

1. I will not give out any information more personal than my first name
2. I will not plagiarize; instead I will expand on others' ideas and give credit where it is due.
3. I will use language appropriate for school.
4. I will always respect my fellow students and their writing.
5. I will only post pieces that I am comfortable with everyone seeing.
6. I will use constructive/productive/purposeful criticism, supporting any idea, comment, or critique I have with evidence.
7. I will take blogging seriously, posting only comments and ideas that are meaningful and that contribute to the overall conversation.
8. I will take my time when I write, using formal language (not text lingo), and I will try to spell everything correctly.
9. I will not bully others in my blog posts or in my comments.
10. I will only post comments on posts that I have fully read, rather than just skimmed.
11. I will not reveal anyone else's identity in my comments or posts.

Any infraction of the Fifth Grade Blogging Rules may result in loss of blogging privileges and an alternative assignment will be required.

Student Signature _____ Date _____

Assessment 3—Blog grading rubric

Student Blog Rubric

Adapted from University of Wisconsin-Stout

Evaluation scale:

Exemplary:	*32-36 points*
Proficient:	*28-31 points*
Partially Proficient or Incomplete:	*< 28 points (resubmit)*

CRITERIA	Exemplary	Proficient	Partially	Incomplete	POINTS
Relevance of Content to Students and Parents	***9 points*** ▪ *Content has useful information* ▪ *Content is clear, concise; points readers to up to date resources.* ▪ *Blog is updated frequently*	***6 points*** ▪ *Content points readers to quality resources, is informative* ▪ *Resources are clearly described so readers can navigate easily*	***3 points*** ▪ *Content points to unrelated information.* ▪ *Resources are not clearly described so readers cannot navigate easily.*	***0 points*** ▪ *Resources pointed to are inaccurate, misleading or inappropriate* ▪ *Annotations are missing, do not describe what is found*	
Use of Media	***6 points*** ▪ *Media enhance content and interest.* ▪ *Creativity enhances content*	***4 points*** ▪ *Most media enhance content.* ▪ *Most files show creativity*	***2 points*** ▪ *Some media don't enhance content.* ▪ *Some use of creativity is evident to enhance content.*	***0 points*** ▪ *Media are inappropriate or detract from content.*	
Fair Use Guidelines	***6 points*** *Fair use guidelines are followed with proper citations.*	***4 points*** *Fair use guidelines are frequently followed; most material is cited.*	***2 points*** *Sometimes fair use guidelines are followed with some citations.*	***0 points*** *Fair use guidelines are not followed. Material is improperly cited.*	
Links	***3 points*** *All links are active and functioning.*	***2 points*** *Most links are active*	***1 point*** *Some links are not active.*	***0 points*** *Many links are not active.*	
Layout and Text Elements	***3 points*** ▪ *Fonts are easy-to-read* ▪ *Use of bullets, italics, bold, enhances readability.* ▪ *Consistent format throughout*	***2 points*** ▪ *Sometimes fonts, size, bullets, italics, bold, detract from readability.* ▪ *Minor formatting inconsistencies exist*	***1 point*** ▪ *Text is difficult to read due to formatting*	***0 points*** ▪ *Text is difficult to read with misuse of fonts, size, bullets, italics, bold* ▪ *Many formatting tools are misused*	
Writing Mechanics	***3 points*** *No grammar, capitalization, punctuation, spelling errors*	***2 points*** *Few grammar, capitalization, punctuation, and spelling errors*	***1 point*** *4+ errors in grammar, capitalization, punctuation, and spelling*	***0 points*** *More than 6 grammar/ spelling/ punctuation errors.*	
				TOTAL POINTS	/36

13 Ways Blogs Teach Common Core

If you aren't blogging with your students, you're missing one of the most effective tools available for improving student literacy and math. Blogs are easy to use, fun for students, encourage creativity and problem-solving, allow for reflection and feedback, enable publishing and sharing of work, and fulfill many of the Common Core Standards you might be struggling to complete. Aside from math and literacy, Common Core wants students to become accomplished in a variety of intangible skills that promote learning and college and career readiness. Look at these 13 benefits of blogging and how they align with Common Core:

1. **provide and get feedbac**k—building a community via comments is an integral part of blogging. If you didn't want feedback, you'd publish a white paper or submit work the old fashioned hard copy way. When students publish their ideas in blogs, other students, teachers, parents can provide feedback, join the conversation, and learn from the student.
2. **write-edit-review-rewrite**—teachers don't expect students to get it right the first time. Part of the writing process is revising, editing, rewriting. This is easy with blogs. Students publish a topic, collect comments, incorporate these ideas into their own thinking, and then edit their post.
3. **publish**—the idea that student work is created for a grade then stuffed away in a corner of their closet is disappearing. Current educators want students to publish their work in a way that allows everyone to benefit from the student's knowledge and work. There are many ways to do that—blogs are one of the easiest.
4. **share**—just like publishing, students no longer create for a grade; they share with others. Blogs allow for sharing of not only writing, but artwork, photography, music, multimedia projects, pretty much anything the student can create.
5. **collaborate**—blogs can easily be collaborative. Student groups can publish articles, comment on others, edit and rewrite. They can work together on one blog to cover a wider variety of topics and/or make its design attractive, appealing and enticing to readers.
6. **keyboarding**—blogs are small doses of typing—300-500 words, a few dozen for comments. This is an authentic opportunity to practice the keyboarding skills students will need for Common Core Standards in 4th grade and up.
7. **demonstrate independence**—blogs are about creativity. No two are alike. They offer lots of options for design and formatting so students can tweak it to their preference. Because they are open 24/7, students can do blog work when it suits them, not in the confines of a 50-minute class.
8. **build strong content knowledge**—blog posts can be drafted as the student collects information, posted when the student is ready. Links can be included to provide evidence of student statements, as well as linkbacks for reference and deeper reading for interested students.
9. **respond to the varying demands of audience, task, purpose, and discipline**—Students can create their work in whatever digital tool fits the audience, task, purpose they are focused on, and then embed it into their blog post. This is possible even in a simplified blogging platform like Kidblog. Most online tools (such as Voki, Wordle, and Tagxedo) provide the html codes that can be easily placed in the blog post. Then, the student at their option can focus on presenting their ideas as music, art, photos, text, an infographic, a word cloud—whatever works for their purposes.

10. **comprehend as well as critique**—student bloggers are expected to critique the posts of others by thoroughly reading the post and commenting based on evidence. If the reader doesn't understand, they ask questions in the comments. This insures that when they evaluate the post, they have all the information required to reach a conclusion.
11. **value evidence**—blogs make it easy to provide all the necessary evidence to support a point of view. Students can link back to sources to provide credit and link to experts to provide credibility for statements. In fact, in the blogosphere, good bloggers are expected to do this as a means of building credibility for opinions they write

12. **use technology and digital media strategically and capably—**certainly blogs are great for writing, but they're also excellent as digital portfolios to display student work developed in a variety of places. Students pick the technology that fits what they're expected to accomplish in a class, then publish it to the blog. Have you seen the movies students put together on a topic? Some are amazing.
13. **understand other perspectives and cultures**—blogs are published to the Internet. Even private blogs are accessed by many more people than possible with a hand-written paper. Students write knowing that people of all cultures and perspectives will read their material, knowing they can add comments that share their beliefs. This encourages students to develop the habit of thinking about *perspective* as they write.

Don't try all of this at once. Spiral into it, starting in second or third grade. Let their blogging grow with their intellectual skills.

Basics of Posts

Blogs used to be too cutting edge for pedestrian rules like grammar and spelling. That's not true anymore. Before students write their first post, remind them:

- *make content pithy*
- *use correct spelling and grammar*
- *avoid slang*
- *appeal to readers with content and design*
- *interact with readers via questions in the blog and answering comments*
- *avoid mistakes, redundancies, jerky flow by proof reading*

Blogs are everything you want in a school activity—student-centered, independent, supportive of problem solving and creative thinking, transferable to many classes and home activities. If you have questions, add them to the comments. I'll see if I can help.

Intentionally deleted

Lesson #17 Spreadsheet Formulae

Vocabulary	Problem solving	Skills
• *Border* • *Cell* • *Decimal place* • *Formulas* • *Place value* • *Right-aligned* • *Row/Column* • *Spreadsheet*	• *I can't find my file (where did you save it?)* • *Formula doesn't work (click cell and check it)* • *All I get is ***** (cell isn't large enough; widen column)* • *I don't see decimal points (check cell formatting)*	**New** *Arrays* *Modeling w/ spreadsheets* *Merge-center* **Scaffolded** *Formulae for add, subtract multiply, divide*
Academic Applications *Math, any class that requires data evaluation*	**Materials Required** *spreadsheet program/rubric, Google Earth rubric, keyboard tool, Evidence Board badges, student workbooks (if using)*	**Standards** *CCSS: Math.Content.5.NBT.B.7* *NETS: 4a, 6a*

Essential Question

What are the essential skills required to analyze numbers?

Big Idea

Spreadsheets are a unique way to share information

Teacher Preparation

- Talk with grade-level team about essential spreadsheet skills (formulas, formatting, graphs, etc.).
- Know how grade-level team teaches place value.
- Continue to collect words for Speak Like a Geek Board.
- Be prepared to integrate domain-specific tech vocabulary.
- Know whether you need extra time to complete this lesson.
- Is class shorter than 45 minutes? Highlight critical items and leave the rest for 'later'.
- Know which tasks weren't completed last week and whether they are necessary to move forward.
- If you offer afterschool tech help and it's manned by students, verify they will be there.

Assessment Strategies

- *Anecdotal*
- *[tried to] solve problems*
- *Decisions followed class rules*
- *Left room as student found it*
- *Shared evidence of learning*
- *Used prior knowledge*
- *Understood decimal places*
- *Completed warm-up, exit ticket*
- *Completed project*
- *Joined classroom conversations*
- *Higher order thinking: analysis, evaluation, synthesis*
- *Habits of mind observed*

Steps

Time required: ***45 minutes either in one sitting or spread throughout the week, with a 10 minute block for keyboarding, 10 minutes for start-up tasks, and 25 minutes for spreadsheet lesson***

Class warm-up: ***Keyboard practice. Remind students to pay attention to posture, hand position, elbows, and flying fingers.***

_____Looking for 'something different' for keyboard practice? Try these:

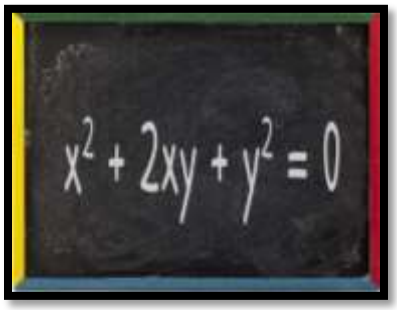
- *Here's a list of online tools: http://wp.me/PZUgb-KH*
- *Here's a list of apps for iPads: http://wp.me/PZUgb-7vk*

_____Continue with Google Earth Board presentations.
_____Any evidence of learning for Evidence Board?
_____Remember spreadsheet projects from 2nd (*Figure 89a*-Gingerbread House), 3rd (*Figure 89b*—Auto Math) and 4th (*Figure 89c*—Graphs) grade—if you used the SL tech curriculum in the past:

Figure 18a-c: Spreadsheet projects K-4

_____For this Lesson, use Numbers, Excel, or Google Spreadsheets. If you have Chromebooks, use the online versions (Office 365 and Google Drive). If you have iPads, use the app versions of MS Office or Mac, but know they will differ from the fully-featured program. Know the differences so you can adapt the project to accommodate them.
_____Today we explore spreadsheet formulas. This lesson ties into pre-programming, logical thinking, and critical thinking (a follow up on coding).
_____What does it mean to 'model' a concept? What are some models you are aware of? Anyone make model airplanes? Lego models? Discuss how important it is that modeling is done carefully, with precision. Each tool used must be exact and structured. In this way, anyone who sees a 'model' gets the message. See *Figures 90a* and *90b* for a math and a science model:

Figure 19a-b: Academic formulae



_____Discuss how spreadsheets support the following Standards for Mathematical Practice:

- *Make sense of problems and persevere in solving them.*
- *Reason abstractly, quantitatively.*
- *Construct viable arguments; critique reasoning of others.*
- *Model with mathematics.*
- *Use appropriate tools strategically.*
- *Attend to precision.*
- *Look for and express regularity in repeated.*

_____Why pick spreadsheets for these goals rather than DTP? Have students revisit the chart you presented when discussing the question (*Figure 91*) earlier this year:

Figure 20—Compare/contrast digital tools

Element	Slideshow	Word processing	Spread—sheets	DTP
Purpose	*Share a presentation*	*Share words*	*Turn numbers into information*	*Share information using a variety of media*
Basics	*Graphics-based* *Design is important to content* *Layout communicates* *Few words, lots of images*	*Text-based* *Design is secondary to content* *Layout may detract from words* *Primarily words communicate*	*Number-based* *Focus on tables, graphs* *Little text; lots of statistics and date* *Almost no words*	*Mix of media—equal emphasis on text, images, layout, color*
Sentences	*Bulleted, phrases*	*Full sentences with proper conventions*	*None*	*Full sentences, bullets,*
Content	*Slides cover basics, to remind presenter what to say*	*Thorough discussion of a topic. Meant to be complete document*	*Statistics, data, charts, graphs*	*To draw an audience in;*
Use	*As a back-up to presentation*	*As complete resource*	*To support other presentation methods*	*Good way to group information for easy consumption*
Presentation	*Speaker presents with their back to the slideshow*	*Speaker reads from document*	*Speakers uses it in a presentation or 1:1*	*Speaker passes out as a handout or take-way*
What else				

_____Why are spreadsheets an appropriate math tool? What insight do they offer (for example, to double check answers)?

_____If students use workbooks, have them fill in the cells in the sample.

_____In this lesson, choose one of these two activities:

- Practice building arrays as an alternative method for answering math problems. This can tie into class discussions on arrays.
- Review spreadsheet formulae for adding, subtracting, multiplying, and dividing discussed in 3rd grade (from Auto Math).

Arrays

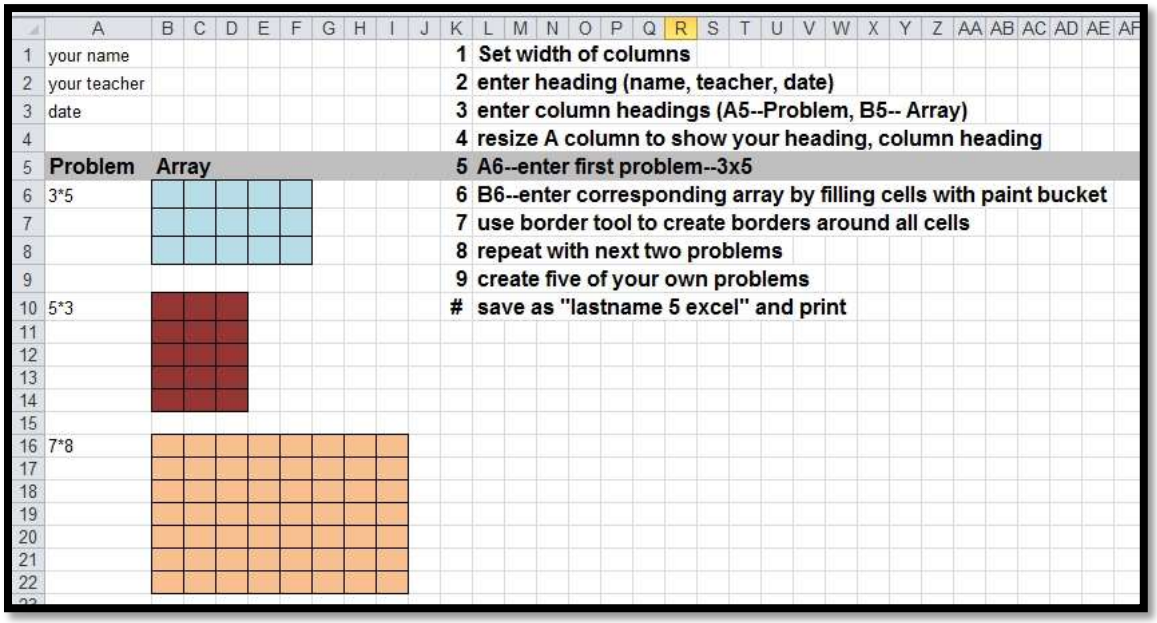
_____If you haven't built arrays in a spreadsheet program, you may want to choose this over a review of formulae to widen student numbers literacy. Open spreadsheet program. Double-click 'sheet one' tab; rename 'Arrays'; change tab color independently.

_____Using *Figure 92* as an example, students build arrays by coloring blocks and adding cell borders to answer relevant math problems.

_____Students have used spreadsheets since 1st grade. Ask them to work as independently as possible (or in small groups) using their problem solving strategies to go through as many steps as possible on their own.

_____Be sure to show students how to set column width so cells are square.

Figure 21—Arrays with spreadsheets



	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD	AE	AF
1	your name										1	Set width of columns																				
2	your teacher										2	enter heading (name, teacher, date)																				
3	date										3	enter column headings (A5--Problem, B5-- Array)																				
4											4	resize A column to show your heading, column heading																				
5	Problem	Array									5	A6--enter first problem--3x5																				
6	3*5										6	B6--enter corresponding array by filling cells with paint bucket																				
7											7	use border tool to create borders around all cells																				
8											8	repeat with next two problems																				
9											9	create five of your own problems																				
10	5*3										#	save as "lastname 5 excel" and print																				
11																																
12																																
13																																
14																																
15																																
16	7*8																															
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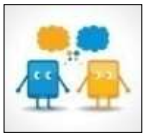
_____When done, save/print/share/publish, as is the custom in your classroom.

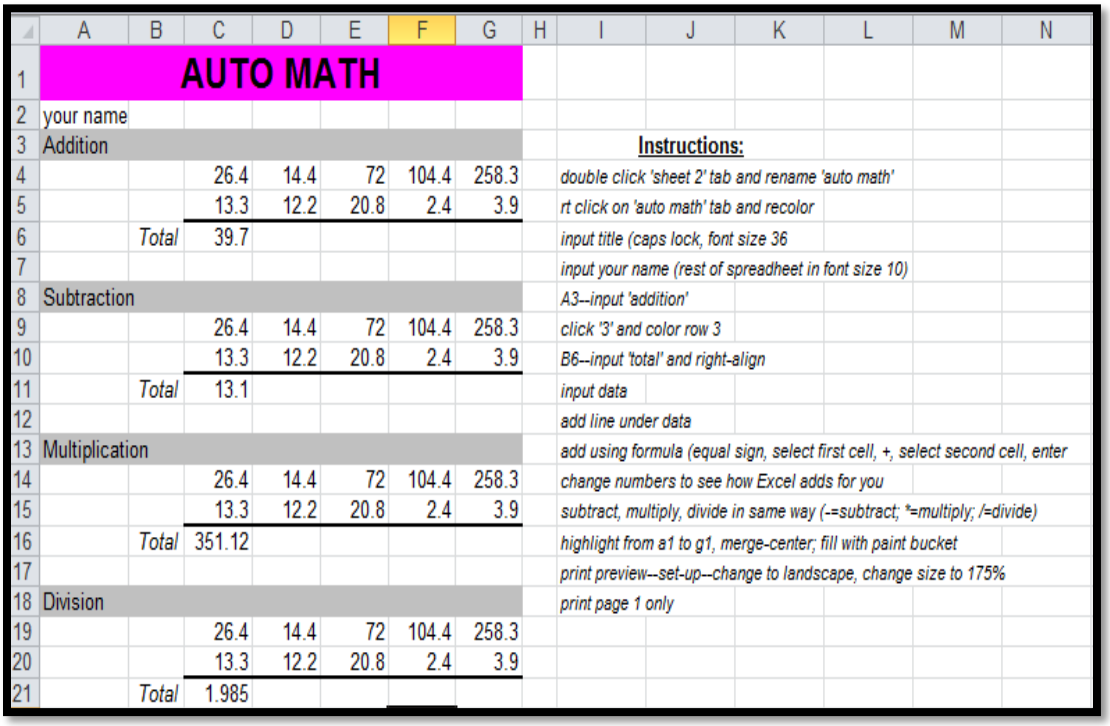
Automath

_____This is a review of skills introduced in 3rd grade. Students should work as independently as possible, only requesting teacher assistance after they've exhausted their problem-solving strategies (from an earlier unit).



_____Follow directions on the right side of *Figure 93* under 'Instructions'.

Figure 22—Automath with spreadsheets

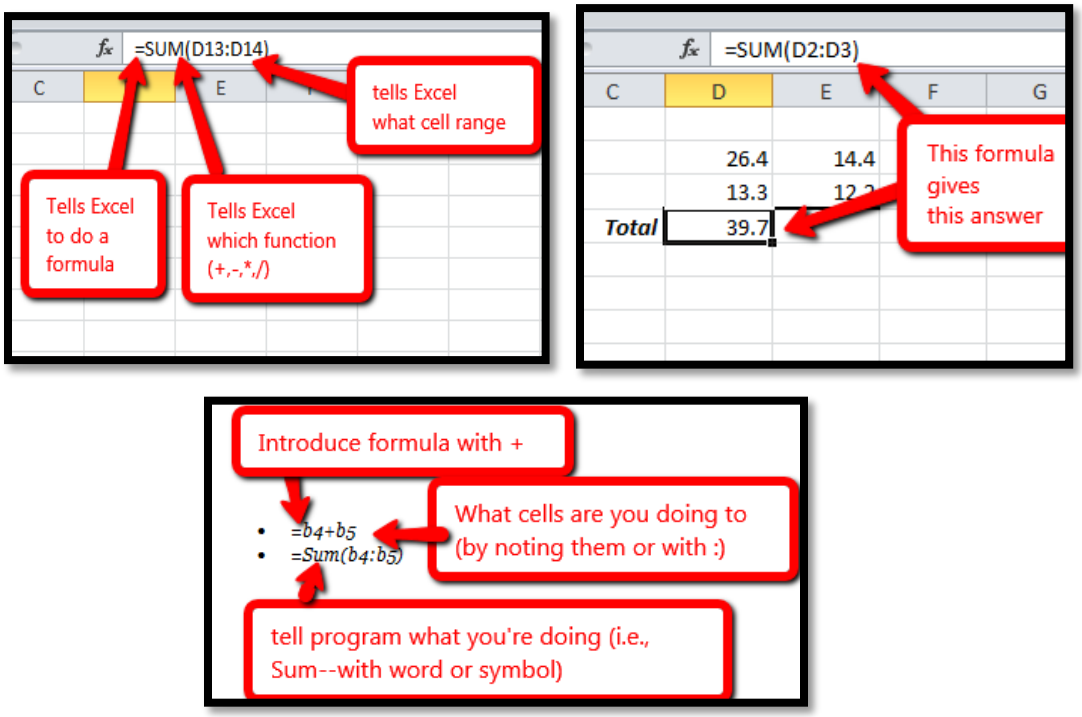


	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1	AUTO MATH													
2	your name													
3	Addition								Instructions:					
4			26.4	14.4	72	104.4	258.3		double click 'sheet 2' tab and rename 'auto math'					
5			13.3	12.2	20.8	2.4	3.9		rt click on 'auto math' tab and recolor					
6		Total	39.7						input title (caps lock, font size 36					
7									input your name (rest of spreadheet in font size 10)					
8	Subtraction								A3--input 'addition'					
9			26.4	14.4	72	104.4	258.3		click '3' and color row 3					
10			13.3	12.2	20.8	2.4	3.9		B6--input 'total' and right-align					
11		Total	13.1						input data					
12									add line under data					
13	Multiplication								add using formula (equal sign, select first cell, +, select second cell, enter					
14			26.4	14.4	72	104.4	258.3		change numbers to see how Excel adds for you					
15			13.3	12.2	20.8	2.4	3.9		subtract, multiply, divide in same way (-=subtract; *=multiply; /=divide)					
16		Total	351.12						highlight from a1 to g1, merge-center; fill with paint bucket					
17									print preview--set-up--change to landscape, change size to 175%					
18	Division								print page 1 only					
19			26.4	14.4	72	104.4	258.3							
20			13.3	12.2	20.8	2.4	3.9							
21		Total	1.985											

_____If students have workbooks, have them turn to that page as they work.
_____**A1**—add title (Auto Math), font size 36; merge-center cells A1-G1 (new skill for fifth grade); color with paint bucket.
_____**A2**—add student name.
_____**A3**—type 'Addition'; click on row 3 to select entire row; use paint bucket to color. Or, select A3-G3 and color with paint bucket.
_____Before inputting numbers, discuss place value. Show students how to format cells for multiple decimal places.
_____Add line beneath bottom row of data.
_____In cell beneath line, use formula to solve math problem. The easiest way to create a formula is (see *Figures 94a-c*):

- *type =*
- *select first cell you want*
- *input function —,+, /,**
- *select second cell you want to use*
- *push enter for answer*

Figure 23a-c: Deconstructing spreadsheet formulae

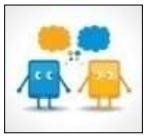


_____In short: A formula is built from four parts:

- *= (introduce formula)*
- ***Function** (add, subtract, multiply, divide)*
- ***Location** (cells that function applies to)*
- ***( )** (group numbers)*

_____Resulting formula will look like *Figure 94c.*
_____Add 'Total' next to the answers; right-align in cell. Complete at least five problems by inputting the formula (not answers) into the spreadsheet.

_____Before entering answer formula, try to get the answer with mental math. This can be done several ways:



- *poll class for answer*
- *race the spreadsheet—will you or program get answer first?*
- *work in pairs—one student mentally calculates answer while second uses formula*

_____Finish problems for other functions in similar fashion using:

- ***+=add***
- ***- = subtract***
- **** = multiply***
- ***/ = divide***

_____In spreadsheet, analyze relationship between these two variables. Identify which are 1) dependent, and 2) independent variables. How does changing one affect the other?

_____Look both for general methods and shortcuts. For example, copy formula *=b4+b5* and replace addition symbol with * for multiplication. Why does this work?

_____When answer shows up, does it look correct:

- *eyeball to determine if it is accurate*
- *use mental math*
- *guess-and-check*
- *use algorithm from class*

_____This can be done in small groups.

_____If students are expected to print, have them switch to 'landscape'; adjust size to fit one page. Share/publish as required.

_____Throughout class, check for understanding.

Class exit ticket: ***Have students 1) line up in arrays), or 2) change data in three cells and watch the program recalculate—depending upon which option you selected.***

Differentiation

- *Do one set of numbers with decimal places, another rounding to next whole number. Evaluate difference between answers.*
- *Have students use a spreadsheet to complete math homework.*
- *Early finishers: visit class internet start page for math websites.*

I cannot conceive that anybody will require multiplications at the rate of 40,000 or even 4,000 per hour.

— F. H. Wales, 1936

Intentionally deleted

Which book?	Price
K-8 Tech Textbook (each grade level—print, digital, or both)	*$32.99/25.99//53.08 + p&h*
K-8 Student tech workbooks (with video, teacher manual)	*$199 per grade level*
35 More Projects for K-6 (aligned w curriculum—digital only)	*$31.99/25.99/52.18 + p&h*
55 Tech Projects—Volume I, II, or both (digital only)	*$18.99/$32.49 + p&h*
K-8 Keyboard Curriculum (print, digital, or both)	*$25.99-$64*
K-8 Student keyboarding wkbks (with video, teacher manual)	*$199 per grade level*
K-8 Digital Citizenship Curriculum	*$29.95/25.99/50.38 + p&h*
K-8 Common Core Lessons	*FREE-$48.55 + p&h*
Pedagogic Articles	*$6.99 (digital only)*
K-8 Tech Scope and Sequences (Word doc)	*$9.99 each (digital only)*
Posters for the Tech Lab	*$2.99 each (digital only)*
16 Holiday Projects	*$4.99 (digital only)*
98 Tech Tips From Classroom	*$9.99 (digital only)*
Classes (certificate and college credit)	*$260-$450*
Project-based learning (lesson plans)	*$1.99 each on varied topics*
New Teacher Survival Kit (K-5)	*$360 and up (+ p&h)*
New Teacher Survival Kit (K-6)	*$380 and up (+ p&h)*
New Teacher Survival Kit (6-8)	*$330 and up (+ p&h)*
Homeschool Tech Survival Kit	*Starts at $99.00*
Bundles of lesson plans	*$7.99 and up*
Mentoring (1 hr. at a time)	*$50/hour and up*
Year-long tech curriculum help (via wiki)	*$145*
Consulting/seminars/webinars	*Call or email for prices*
Total	

Fill out this form (prices subject to change).
Email Zeke.rowe@structuredlearning.net.
Use PayPal, Amazon, TPT, pre-approved district PO
Questions? Contact Zeke Rowe

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