Classworks Research

A Research-Proven Solution

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1. Instructional Design

There is a wealth of information prescribing how to optimize the learning process. The Madeline Hunter Model outlines the elements of effective instruction. Gagne also provides a basic structure for the presentation of information via his elements of instruction. Keller provides sound motivational strategies to embed within computer-aided instruction. Each of these as well as numerous others has laid the groundwork for sound instructional design that has been proven effective time and again. Applying this wealth of knowledge is critical for the design and development of sound and effective instruction.

Implementing such strategies through instructional technology creates a potential for incredible impact on today's students who are most comfortable and engaged when interacting with technology. "More and more of our students lack the true prerequisites for learning—engagement and motivation—at least in terms of what we offer them in our schools. Our kids do know what engagement is: Outside school, they are fully engaged by their 21st century digital lives. If educators want to have relevance in this century, it is crucial that we find ways to engage students in school. We must engage them in the 21st century way: electronically. We need to incorporate into our classrooms the same combination of desirable goals, interesting choices, immediate and useful feedback that engage kids in their own lives," relates Marc Prensky in "Listen to the Natives" from Educational Leadership.

One of the greatest benefits of technology is its capacity to expand students' understanding while engaging in the process of learning. It is virtually impossible to remain in a passive, recall level of thinking when students are authentically engaged and participating in meaningful performance-based activities.

Sound instructional design and best practices in education are the basis for Classworks. Independent studies and curriculum reviews confirm the research-proven design underlying Classworks structure. Rigorous and relevant instruction that requires complex levels of thinking and performance helps today's students learn in their most optimal setting.

MANAGING THE INTEGRATION OF TECH-NOLOGY INTO INSTRUCTION WITH CLASSWORKS™

The school landscape is littered with un-used technology which fails to be inte-grated into a meaningful curriculum. One can safely argue that the last sector of soci-ety that remains "unwired and unchanged" is public education. (Bailey et al., 1996) In-creasingly as we approach the next century, technology is accepted not only as a re-source for enhancing the existing K–12 cur-riculum, but also as a catalyst for transforming the very nature of teaching and learning. As Linda Roberts, Director of the U.S. Department of Education's Office of Educational Technology, has observed, "Evidence shows that the technology has enormous benefits for all of our kids" (Clopton, 1997). The importance of these benefits is reflected in the scope of the U.S. Department of Education's four goals for fostering technological literacy:

1. Teachers will have the training and support they need to help students learn using computers and the infor-mation technology.

2. Teachers and students will have mod-ern multimedia computers in their classrooms.

3. Every classroom will be connected to the information highway.

4. Effective software and on-line re-sources will be an integral part of every school's curriculum. (Trotter, 1996)

Despite this emphasis, the promise of effec-tive integration of technology into instruc-tion remains largely unfulfilled, and tech-nology has yet to become an "integral part" of instruction in most schools and classrooms. While teachers recognize the value of technology, the requirements of ef-fective integration are often seen as a source of "anxiety and stress—an obstacle to overcome" (Picus, 1997). A wide range of software products and technology tools is available, but these are often underuti-lized and poorly integrated into the curricu-lum. One significant reason is that unlike teaching with textbooks, which have a well-established classroom history of help-ing teachers "[make] the leap from inten-tions and plans to classroom activities" (Schmidt et al., 1996), there are few mod-els for using computers in instruction. Re-search on the relationship between technology and education has revealed that "Technology in and of itself, does not directly change teaching or learning. Rather, the critical element is how technol-ogy is incorporated into instruction" (Gré-goire et al., 1996).

However, in all too many cases, teachers are left without useful guidance in how to intelligently combine technology with what they are already doing in their classes. As a result, educational software programs, even if used, are often provided "as is" to stu-dents, without creative implementation, adaptation, and instructional support. In this way, technology tools are often rele-gated to the periphery of teaching rather than effectively integrated.
This difficulty is compounded by the current emphasis on content-area educational standards. During the past ten years, pro-fessional groups in each major area of education, including the National Council

of Teacher of Mathematics (NCTM), National Academy of Sciences, National Council of Teachers of English (NCTE), and National Council for the Social Studies (NCSS), have articulated new standards or goals in their discipline.1 School districts expect teachers to be able to correlate their instructional goals to these standards, or to state or local standards derived from national standards, and to ensure that all students receive a standards-based curriculum linked to content and performance. When it comes to integrating software, however, teachers are often left on their own to determine how and where 1 Curriculum and Evaluation Standards for School Mathematics (1989); National Science Education Standards (1995); Standards for the English Language Arts (1996); Expectations of Excellence: Curriculum Standards for Social Studies (1994).

Managing the Integration of Technology into Instruction with Classworks™ content standards are met and to ensure that performance is at appropriate levels. If technology is to play a meaningful role in meeting these standards, teachers must be supported in integrating technology in a way that is consistent, equitable, substantive, instructionally sound, and adaptable to the specific circumstances of their classrooms and communities.

The sheer scope and variety of instructional technology products contribute to the problem by making the teacher's integration task more complex and time-consuming. Many teachers feel overwhelmed by the challenge of investigating a wide range of software titles from a standards-based perspective, judging their quality, linking learning outcomes to specific content and performance objectives, then developing a plan for tying each program into instruction and monitoring student performance. Faced with this challenge, teachers may rely on the reputation of well-respected software products and publishers to target their initial investigations; but effective implementation still requires a significant time and energy investment. Since many of the best-known software titles were not designed to fit together instructionally, teachers face the additional challenge of integrating these products with each other, as well as with other classroom materials and with the teacher's own practice. Fundamentally, if teachers do not have the curriculum support, knowledge, time, and resources to integrate technology into instruction easily and effectively, then it is unlikely their students will derive measurable benefits from this valuable resource.

MANAGING THE INTEGRATION OF TECHNOLOGY INTO INSTRUCTION WITH CLASSWORKS™ –
CURRENT TECHNOLOGY MODELS

Many educational software publishers provide implementation suggestions describing how to integrate their products in the classroom to support a standards-based curriculum. These implementations typically fall into two broad contrasting models: standalone software and integrated learning systems. The remainder of this paper addresses the strengths and weaknesses of these two models and introduces a third alternative, Classworks, which has advantages of both models without their concomitant disadvantages.

STAND-ALONE PRODUCTS

One advantage of using stand-alone products is the wide variety of choices in virtually all curriculum areas and at all grade levels. This versatility runs the gamut from straightforward skill and practice software to content-based tutorials, logic puzzles, information resources, and sophisticated multimedia presentation tools. Although choosing from the many titles can be difficult, teachers are easily attracted to popular software titles that have been

developed by established educational publishers. In particular, they are drawn to products that have earned awards of excellence and positive reviews from reputable organizations. School versions of quality stand-alone products typically include teacher's guides, correlations of the software to national standards, student activities, and suggestions for classroom implementation and integration. Some exemplary products even come with off-computer manipulatives designed to make it easier for teachers to integrate the computer with hands-on activities. Unfortunately, teachers usually perceive stand-alone products as "add-ons" to the curriculum rather than as primary sources of knowledge, information, and instructional activity. There is little, if any, attempt to integrate these programs into daily instruction. In practice, most teachers assign students to these programs "outside" the regular curriculum to accomplish one of the two "Rs"—remediation or reward. In working with the various choices in the school's software library, teachers find it difficult to maintain the connection among the content of the software programs, the student's time on task, and the specific learning objectives of a subject area. Furthermore, without a built-in management system, there is no way of knowing exactly where to place students in a software program or how much time they might need to derive its full benefits. Because there is no consistent monitoring and reporting of a student's progress and performance, teachers do not know what students may have learned (or not learned), and therefore cannot use ongoing assessment results to guide instructional planning. As a result, student work with the software becomes largely irrelevant to the main thrust of the teacher's instruction, thereby losing most of the benefits that come from an effectively integrated program.

INTEGRATED LEARNING SYSTEMS

Traditionally, an integrated learning system (ILS) provides curriculum within a carefully designed management system, removing from the teacher the burden of choosing and assigning appropriate software. Using an ILS curriculum manager, teachers can match lessons to particular objectives and assign parts or all of a sequence of units, lessons, and activities to individuals and/or groups of students. The progress and performance of each student is monitored and reported both electronically and in print. The system can also use adaptive strategies to adjust the activities that are made available to the student, deciding not only what kind of remediation or enrichment is appropriate, but also when to deliver it. Teachers can access information about student performance in a variety of ways and at any time. If necessary, they can adjust the curriculum that their students will receive.

Curricular offerings in an integrated learning system are typically well defined and reflect a scope and sequence for one or more disciplines and grade levels. The curriculum is usually correlated to textbooks and/or objectives based on national and state standards defined by groups such as the NCTM or the NCTE. These systems usually include print materials that can be used to complement the computer-based curricula.

Managing the Integration of Technology into Instruction with Classworks™
One significant disadvantage of traditional integrated learning systems, however, is the relatively inflexible, comprehensive instructional model they impose on schools and teachers. Although most ILS programs allow customization of the electronic curriculum and limited use of third-party software, many teachers are hesitant to adjust the system, uncertain what will happen if they do. Furthermore, such systems are generally designed to be self-sufficient,

and are not well-suited to innovative repurposing and introduction of outside material. Similarly, the instructional value of individual program components may be reduced if they are resequenced or used outside their original environment. As a result, teachers often choose to use the system "as is" rather than adapting it to their own circumstances. They minimize their use of the ILS or compartmentalize it from the rest of their teaching instead of creating a true integration of the software with the teacher's best instructional knowledge and practice.

Another important disadvantage of traditional integrated learning systems is that they do not include a broad range of familiar and well-known educational software products, but are limited instead to the offerings of a single software development company. Integration of third-party products into the ILS may be supported technically, but only to the level of launching the product and reporting time on task. Rather than glean the best of what has been created in educational software, teachers must make do with whatever is included in the ILS—or if they expand the system's offerings with third-party software, they must be prepared to accept reduced usability and (in many cases) technical problems.

THE CLASSWORKS MODEL
Classworks, with its integrated library of popular and award-winning learning software products, combines the quality, flexibility, and variety of stand-alone programs with the computer-based management tools and integration support of an ILS environment. Students are directed to a sequence of activities that has been seamlessly woven together from many different programs to meet specific learning objectives.

For example, the fourth grade math unit Adding and Subtracting Decimals incorporates age-appropriate activities targeting the unit objective from both Math Blaster® and Knowledge Adventure's JumpStart Adventures 4th Grade™. In this way, the unit combines the instructional power of two proven software programs into an integrated, computer-managed content sequence. Thus, Classworks offers the primary advantages of both the stand-alone and ILS models without their corresponding disadvantages.

This example illustrates the effective combination of award-winning software and a flexible, open management system that is the hallmark of the Classworks approach. Software products used to design the Classworks curriculum sequences include a broad range of familiar, high-quality products that have already earned popularity and respect among educators due to their instructional effectiveness. Each unit consists of activities from products such as Knowledge Adventure's JumpStart Learning System™, Tom Snyder's The Graph Club®, and Roger Wagner's HyperStudio®. These popular and well-respected products, with which teachers may already be familiar as individual standalone software, have been structured into learning activities that address specific curriculum objectives, then organized into an instructionally sound sequence. Thus, when teachers assign a Classworks sequence to their students, they can be sure that students are using some of the best products on the market to learn important skills and concepts, and to practice applying them in real-world contexts. Further, the rich array of instructional approaches presented by this range of software titles enhances learning for all students while supporting a wide variety of student learning styles.

Like an ILS, Classworks contains a sophisticated curriculum management system that can be used to modify existing Classworks sequences or to create a unique curriculum sequence. Modifying or creating sequences

using the existing instructional units and activities is very easy: teachers simply copy a particular sequence of units and their activities, then use the cut and paste commands to reorder activities and units. Similarly, teachers can easily include additional thirdparty software to the system and integrate activities from Managing the Integration of Technology into Instruction with Classworks™ these products right into the Classworks curriculum. For example, if teachers have been using a particular stand-alone product in their classrooms, such as Microsoft® Word or Claris's FileMaker®, they can add a network version of the program to the Classworks manager and be assured that it will run successfully and that it can be used in an integrated way as part of the curriculum.

Using Classworks, teachers can create a template file within the program, assign it to students, then open each student's work file and write comments to the student directly in the file. This openness and flexibility of the Classworks management system represents one of the program's major strengths in supporting the specific needs of individual schools, teachers, and students. As one technology coordinator whose school district uses Classworks explained, "We looked at a lot of different systems before purchasing Classworks two and a half years ago. We had an ILS system previously . . . and we were looking at another one . . . but we felt [the company] didn't offer the flexibility of Classworks. We also wanted to be able to integrate name-brand software—our teachers like to swap software in and out." 2 2 Comment by Kathy Clark, Technology Coordinator, Keystone Oaks School District, Keystone Oaks, Pennsylvania, in a Classworks user survey

MANAGING THE INTEGRATION OF TECHNOLOGY INTO INSTRUCTION WITH CLASSWORKS™ – ELEMENTS OF THE CLASSWORKS SYSTEM

How does Classworks solve a school district's need to manage easily the integration of computers into instruction? The secret lies in the more than 1,000 units of instruction in Language Arts and Mathematics. These units draw from more than 150 diverse software programs, including many award winning titles. This core Language Arts and Mathematics curriculum can be further supplemented with cross-curricular units through the addition of other Classworks software titles, such as Vital Links™, a cross-curricular program with a Social Studies emphasis, and English Express® Deluxe, which provides a strong ESL focus. Because every instructional unit—whether predefined, modified, or uniquely created using a third-party product— addresses a specific skill or objective, the sequences can easily be linked to district or school curriculum objectives through the Classworks management system.

THE CLASSWORKS CURRICULUM

Classworks provides teachers with well-defined instructional units whose skills spiral through the elementary curriculum. The Classworks core curriculum includes a comprehensive sequence of over 1,000 units distributed among nine instructional sequences in Language Arts and nine sequences in Mathematics, covering grade levels K–8. Units and activities within sequences designed for students in kindergarten and first grade contain audio reinforcement. A typical grade-level Classworks sequence contains sufficient instructional material to span an entire school year. Each sequence is based on the content of selected national and state standards and frameworks and nationally recognized standardized tests, and is designed to complement a variety of

widely used textbooks. Resources consulted in the design of the Classworks sequences include:

- State frameworks from California, Florida, Texas, and New York
- NCTM and NCTE Standards
- Stanford Achievement Test (SAT-9), California Achievement Test (CAT), Comprehensive Test of Basic Skills (CTBS), and Iowa Test of Basic Skills (ITBS) objectives
- Textbook series published by Harcourt, Pearson, MacMillan-McGraw-Hill, and Houghton Mifflin

The units that make up a sequence provide a variety of activities pulled from one or more software titles. As students work in a unit, Classworks reports their progress and keeps a record of their performance. Teachers who plan to have students work at their own pace and level can assign them to take a Placement Test before they begin an instructional sequence in Classworks. Depending on their Placement Test performance, students may be assigned to work in different grade-level sequences and may receive different unit assignments within a sequence. Items on the Placement Test are based on skill objectives of the units in the sequence. Taking the Placement Test is a one-time only event. From that point on, each student's path through a sequence is managed automatically by Classworks unless modified by the teacher. Each instructional unit in a sequence focuses on the development of a discrete skill. The title of the unit reflects its objective. Each unit includes five interactive environments: a Mini-Lesson, two Activity Banks, a Quick Quiz and a Project.

Mini-Lesson. The Mini-Lesson in each unit provides quick, didactic instruction on the skill being addressed in the unit. Each Mini-Lesson consists of three interactive parts: Learn, Apply, and Review. The Mini-Lesson presents the skills and concepts that will be tested in the unit Quick Quiz.

Activity Banks. Two sets of ten to thirty activities lie at the heart of every unit. These activities provide students with instruction, practice, and assessment on the skill of the unit. Activities are taken from individual software titles within the Classworks library, such as Grammar Games, Spell It® Deluxe, Math Keys, and Math Blaster. Managing the Integration of Technology into Instruction with Classworks™ Each activity in an Activity Bank generates a performance score that is reported to the student and the teacher. After completing the Mini-Lesson, students begin in the default Activity Bank but can be automatically branched to the remedial Activity Bank if their performance after three activities fails to meet a given criterion level, which can be set by teachers.

Quick Quiz. This ten-item assessment tool measures the student's proficiency in the skill of the unit. If students score less than a minimum criterion score on the Quick Quiz, they are automatically branched to the remedial Activity Bank for more instruction and practice. At the end of this second set of activities, students again take the Quick Quiz. If teachers have elected to intervene after students fail a quiz, then students are stopped and a message appears within Classworks instructing them to speak to their teacher. The management system generates a report that allows the teacher to tell which students are at-risk. If teachers have not elected to intervene, then when students finish a quiz, they go on to the project or start the next unit in the sequence regardless of their scores. All scores and time-on-task are reported through the management system.

Project. This optional section provides an open-ended, interdisciplinary learning experience for students. Projects are described in an accompanying notebook of activities and black-line masters, and involve the use of software tools within Classworks such as HyperStudio, The Cruncher, The Multimedia Workshop, and Kid Works Deluxe. Internet resources are used throughout the projects. The notebook provides guidelines for each project to help teachers evaluate completed projects.

MANAGEMENT OF COMPUTER-BASED LEARNING

The strength of the Classworks solution lies not only in the depth and breadth of its curricular offering, but also in the flexibility it provides to teachers through its instructional management system. Any teacher who uses Classworks can adapt the program to perform any of the following tasks:

- Modify the existing learning objectives (i.e., units and activities) to match a local curriculum
- Integrate third-party courseware within the curriculum management system
- Individualize assignments
- Automatically manage a student's progress through the assigned courseware
- Obtain a variety of progress and performance assessment reports
- Evaluate student products on the computer (e.g., writing activities, spreadsheets, multimedia presentations) and store teacher assessments of those products within the curriculum management system

One experienced Classworks educator characterized the system's strength and flexibility in the following terms: Because Classworks doesn't dictate the curriculum, we're able to custom-design the scope and sequence within the program to support the curriculum. The teachers feel that Classworks helps to fill in the gaps in the student's knowledge as well as reinforce new skills. It has something in it for all ages, ability levels, and learning styles, and it helps the teachers work with a wide variety of skills and instructional objectives.3 Using the Classworks Curriculum Editor, teachers can copy and then modify a predefined sequence. To modify a copy of a predefined sequence, teachers simply highlight particular units in a sequence and click an Enable/Disable button that turns the selected unit(s) on or off. This same procedure can be used to modify the activities in a unit. Teachers can also modify the order of units in a sequence and of activities in a unit.

3 Comment by Kathy Clark, Technology Coordinator, Keystone Oaks School District, Keystone Oaks, Pennsylvania, in a Classworks user survey Managing the Integration of Technology into Instruction with Classworks™

In addition, teachers can create a new, custom sequence, then copy and paste units from existing Classworks sequences into the new sequence. This same copy and paste function can also be used to create a new, custom unit comprised of selected Classworks activities.

Teachers use a special feature within the Curriculum Editor, called the Ancillary Lesson Launcher (ALL), to add third-party software and associated documents (templates) to any sequence. These documents become activities within units. For example, teachers may add Microsoft Works to Classworks and create a template file that students will use as an activity within a unit. When students log into the system and choose this activity from the menu of activities in a unit, Classworks automatically opens the appropriate template in Microsoft Works. Thus, teachers can create

unique curriculum sequences that meet specific instructional goals.

REPORTING AND ASSESSMENT OF STUDENT LEARNING

Research on the contribution of new technologies to learning emphasizes the benefits of computer-based assessment capabilities such as those found in Classworks. In a report on the assessment capabilities of computer-based learning systems, three researchers[4] noted that It was the diagnostic function of the system that produced the most visible if not the most pronounced effects on the teaching staff. One member of this staff who was very skeptical at the start. . . . explained, "Lydia has word skills problems but I was identifying the wrong skills— the integrated learning system sorted that for me and I could direct my efforts to solving the child's problems." . . . In the opinion of the school's administration, the thought process that use of this system had triggered had benefited other aspects of [the teacher's] teaching. (reported in Grégoire et al., 1996) The purpose of computer-based assessment is to diagnose each student's strengths and weaknesses [4] Underwood et al. (1996) so teachers can provide the most appropriate intervention, including meaningful remediation or enrichment. Classworks provides tools that enhance the ability of teachers to assess their students' learning in a variety of ways.

Management System Reports. Teachers can use the management system reports to access information about their students' progress through the curriculum units by means of the instructional management system. Information presented in these reports includes units that have been assigned to students, units they have started and completed, time on task, and scores they have earned on the activities and quizzes within a unit. These reports can be printed and shared with students and parents. Management system reports and assessments provide teachers and parents with the means to assemble a continuous history of each child's progress and performance. As reported by a district technology coordinator, I use the reporting features of Classworks a lot—at least eight times a year and on demand as teachers request. Our teachers are responsible for reporting on special students, and they often ask me for factual material. I can provide this for them from Classworks reports.[5] Feedback to Students. As students work through the mini-lessons, activities, and quizzes in a Classworks unit, they receive immediate feedback and ongoing guidance from the software. This empowers students to improve their own performance and become independent learners. As one teacher reported, Classworks reporting features have been wonderful for us because [they give] kids the opportunity to become responsible for their own learning and to monitor and adjust their own learning as a result of that.[6]

Classworks also provides effective tools for teachers to give feedback to students electronically. When students [5] Comment by Tony Muller, Technology Coordinator, Island Park School District, Island Park, New York, in a Classworks user survey. [6] Comment by Catherine House, Language Arts/Reading District Coordinator, Wilson Central School District, Wilson, New York, in a Classworks user survey. Managing the Integration of Technology into Instruction with Classworks™ complete a document on the computer, such as a spreadsheet or a word processing file, they can use Classworks to send the document to the teacher to be reviewed. Teachers can review the student's work on the computer and assign it a grade, then send it back to the student with attached comments. Additionally, teachers can use the e-mail function in Classworks to communicate with students about their per-

formance. As teachers use the instructional management system to review their students' progress, they can identify those who require special attention—whether extra praise for a job well done or a reminder of work yet to be completed—and send an appropriate message. When students log into Classworks the next time, a message on their screen lets them know they have received e-mail from their teacher.

Grade Level Evaluation (GLE). The Grade Level Evaluation (GLE) program, published by Tudor Publishing, is an independent assessment tool designed to measure student mastery of appropriate skills and knowledge at each grade level. Thousands of test items in Language Arts and Mathematics correspond to topics presented in major textbooks and curriculum guides throughout the United States. These are not limited to the skills that represent a curriculum focus for Classworks. This means that teachers who use Classworks have access to a standardized assessment tool they can use to determine how well their students are doing in relation to skills that are particularly important to the school, district, or state.

Teachers can assign the GLE to students at any time. Items are pulled from the item bank according to the particular skills teachers want to assess. GLE results are available through the Classworks management system in a set of detailed electronic and print reports. These reports provide benchmarking information about the mastery levels of individuals or groups of students. Information is available in a variety of formats, including reports that are appropriate for sharing with students and parents.

Projects. Each of the culminating unit projects within Classworks involves the creation of one or more products that require students to apply the skill they have learned to solve real-life problems. Projects may involve the creation of documents on the computer, such as a spreadsheet in The Cruncher or a writing assignment in Kid-Works Deluxe, as well as work off the computer. Projects provide both a means of assessing student knowledge in the unit as a whole and an additional teaching opportunity. Each project includes a list of assessment objectives teachers can use to evaluate student work. Classworks and Portfolio Assessment. Classworks provides a broad range of materials that can be included in a comprehensive portfolio of student work. Printed management system reports can be used to document how much work students have completed on the computer, as well as report their scores. Drafts of electronic documents created by students and submitted to teachers can be stored on the computer or printed out for portfolio inclusion, together with teacher comments and student revisions, providing a profile of each student's work over time. Other work created by students, including items from student projects, can also be included in portfolios. Together, these resources can be used to document what students have learned within Classworks and their progress toward mastering the skills that are taught in the Classworks units.

PROFESSIONAL DEVELOPMENT AND IMPLEMENTATION SUPPORT

Learning how to integrate any software application into instruction takes time and a commitment on the part of a school district and its teachers. The experience of largescale technology-based projects suggests two types of training needs: (1) Preliminary development activities that cover the product to be used and its associated pedagogical approach, and (2) ongoing support provided by software publishers and by other participating teachers (Grégoire et al., 1996). As one superintendent whose teachers are using Classworks puts it, the success of any

technology initiative is only as good as the support to sustain it. The support and training we have received from the Classworks people couldn't have been better. Concerns never had the time to become problems. Classworks help is only a phone call away. The numerous training sessions were geared to our staff's needs rather Managing the Integration of Technology into Instruction with Classworks™ than some "canned" process. The support really made the product work for us. 7 The developers of Classworks provide both initial and ongoing support services through what is known as "Full-Circle Service™."
Quoting a technology coordinator,
The support [from Classworks] has been wonderful. We really needed help in the beginning because we were setting up a new district-wide network, Internet access, e-mail, etc., along with Classworks, and they were very helpful with everything. We had had a lot of technical problems with [an ILS] system, and that hasn't been the case at all with Classworks.8 Classworks provides its users with three levels of training and professional development, including both preliminary development activities and ongoing support:

- Immediately after the installation of Classworks, technical experts train local system administrators in preparing rosters of teacher and student names, assigning classes to teachers, placing students in classes, and assigning a Classworks curriculum sequence to a class.
- Soon after the system administrator training, teachers are provided hands-on training with the Classworks curriculum sequences and instructional management system, including demonstrations of how to use the product with students.
- Less formal follow-up training is provided for everyone using Classworks. Sessions may involve specific questions or advanced features, including customization of Classworks to meet

the needs of individual students, creation of unique curriculum sequences, and use of the Ancillary Lesson Launcher (ALL).

7 Comment by Dr. Donald Tylinski, Superintendent, Freeport Area School District, Freeport, Pennsylvania, in a Classworks user survey 8 Comment by Kathy Clark, Technology Coordinator, Keystone Oaks School District, Keystone Oaks, Pennsylvania, in a Classworks user survey

BENEFITS FOR EDUCATORS

Using Classworks provides educators with several important benefits, including options for managing computer-based learning, linkage of instruction to objectives, and tools for tailoring instruction to specific students' needs. Each of these benefits is described briefly below.
Management of Computer-Based Learning. Reliance on a computer-managed instructional system changes the function and work of teachers in the classroom, in That part of the transfer of information inherent in teaching is shifted from the teacher to the technological media, and the teacher has more time to support each student in the individual process of discovery and mastery of knowledge, skills and attitudes. (Grégoire et al., 1996) Teachers become more like facilitators and coaches, tailoring their assistance to the needs of individual children. As one superintendent recalled, we have used Classworks in our district for the past four years, and I feel that one of the long-term effects of using this product will be to help change the way we teach our students. The teacher no longer stands in front of the class and lectures. Now we see our teachers moving about the classroom and acting as facilitators, working with students individually and in groups, both on and off the computers.9 Instruction Linked to Objectives. In Classworks, the scope and sequence in Language Arts and in Mathematics reflects a set of objectives based on a review of

major textbooks and various state and national standards. Each activity in a unit speaks to the particular objective being presented, thus making it easy for district personnel and teachers to correlate units to corresponding local, state, and/or national standards. As a Language Arts/Reading coordinator in a school district in New York State noted, 9 Comment by Dr. Donald Tylinski, Superintendent, Freeport Area School District, Freeport, Pennsylvania, in a Classworks user survey Managing the Integration of Technology into Instruction with Classworks™

We were looking for a package that matched the New York State standards and was a good instructional match with our curriculum, and we felt that Classworks fit the bill. . . . Out of 165 schools in the Western New York area, our sixth graders came [in] third in reading—it's hard to say how much of this we can attribute to Classworks, but we feel it has had an impact.10 Tailored Instruction. Classworks gives teachers the flexibility to tailor instruction to the needs of each student. Through the two-tiered activity banks, the program automatically adjusts the curriculum to meet the needs of individual students, based on the system's ongoing performance assessment. Additionally, teachers can adapt the existing units or create their own units to meet their individual instructional goals. As one educator noted, Classworks accommodates students with all ability levels and varying learning styles. Classroom teachers are able to control the degree of difficulty and mastery level to meet the individual needs of gifted as well as special needs students.11

Because Classworks contains more than 150 software titles, a great variety of software is available to the teacher to help students learn particular skills: Classworks seems to work well with students with different learning styles. From the early

grades, we use a very hands-on program, and the Classworks combination of visual, auditory, and kinesthetic approaches fits very nicely. . . . Classworks is interactive—it takes the students back and helps them find and understand their mistakes. This requires students to do more thinking than just filling in the blanks on a worksheet.12 10 Comment by Cathy House, Language Arts/Reading District Coordinator, Wilson Central School District, Wilson, New York, in a Classworks user survey 11 Comment by Joseph P. Malak, Assistant Superintendent of Curriculum, Freeport Area School District, Freeport, Pennsylvania, in a Classworks user survey 12 Comment by Cathy House, Language Arts/Reading District Coordinator, Wilson Central School District, Wilson, New York, in a Classworks user survey

BENEFITS FOR STUDENTS

Just as Classworks provides benefits to educators, it also provides specific benefits to students. These include increased motivation, the capability for self-pacing, exposure to a variety of stimulating software products, and support for the special needs of individual students. Reflecting on his school's use of Classworks, one superintendent observed:
Everyone's bottom line is whether students' achievement improved as a result of using Classworks. The scores in our district, when compared to schools in the state with similar conditions, are well above expectations. We can't positively identify Classworks as the sole factor affecting student achievement scores; however, when no other variables within the school system have changed, it would be hard to argue against the fact that Classworks played a major role.13 Motivation. Research suggests that quality educational software can motivate students. In a three-year study on the use of technology by students in grades K–2 conducted by the Center for Research, Evaluation and Train-

ing (CREATE) in Burlingame, California, researchers concluded that students are drawn to technology and are intrinsically motivated to use computers. At each site we visited, we saw students who were always eager to have their time at the computer, whether to complete an assignment from the teacher or to engage in activities of their choice. When children were offered a choice of many classroom activities, computers were always the most popular option. (Guthrie and Richardson, 1995)

A review of the literature finds positive effects of technology on attitudes toward all major subject areas (Sivin-Kachala and Bialo, 1996). Linda Roberts, Director of the U.S. Department of Education's Office of Educational Technology, also 13 Comment by Dr. Donald Tylinski, Superintendent, Freeport Area School District, Freeport, Pennsylvania, in a Classworks user survey Managing the Integration of Technology into Instruction with Classworks™ attests the motivational value of well-designed computer software for basic tasks such as drill and practice: The highly-effective drill and practice and tutorial software that is out there . . . shows very promising results for students who need more time practicing. The technology can really help us extend the practice time for these students . . . in highly-motivating ways. (Clopton, 1997) Similarly, the U.S. Congress's Office of Technology Assessment has concluded that technology can be a key vehicle for stimulating learning, primarily because it creates environments and presents content in ways that are more engaging and involve students more directly than do textbooks and more traditional teaching tools. (U.S. Congress, 1995) Units within Classworks contain activities ranging from fun-filled basic skill and practice programs (e.g., Math Blaster and the JumpStart series) to openended tool products (e.g., The Cruncher and HyperStudio). This variety keeps students motivated, since each activity is different. One superintendent noted,

"It can be tough to get students' attention these days—we have to compete with the media—but Classworks does a great job of engaging them."14 Self-Pacing. One of the advantages of instructional software for students is the ability it provides for them to work at their own pace. The variety of quality software included in the Classworks library permits students to spend more time in the areas where they feel they need more work, or with activities they find more engaging or that connect best to their own learning style. Students can also repeat sequences. Because the system reports the time that each student spends on an activity, teachers can use this information to see if and when they need to intervene. Teachers can monitor how students are pacing themselves through a sequence so they are 14 Comment by Dr. Donald Tylinski, Superintendent, Freeport Area School District, Freeport, Pennsylvania, in a Classworks user survey continuously challenged at a level that maintains their interest and motivation. According to the findings of a two-year study conducted by Lani M. Van Dusen et al., 15 Of all the areas in which change could occur, the time students concentrate on a learning activity heads the list. Because they love working with a computer, because they can progress at their own pace, and because they receive immediate feedback on what they are doing, "the students remain engaged." (reported in Grégoire et al., 1996) Variety of Stimulating Software Titles. The variety of software within Classworks captures the attention and supports the varied learning styles of nearly every student. For example, in the area of early learning software, titles such as JumpStart Kindergarten®, JumpStart 1st Grade®, Kid Phonics™, and Knock Knock™ provide students with a wide assortment of age appropriate experiences in reading, language arts, mathematics, music appreciation, and artistic expression. For elementary school students, Classworks features a broad array of tutorial, skill, and practice

software, including such titles as Reading Maze™, which introduces essential reading skills through fascinating mazes; Grammar Games, in which students learn the rules of grammar in a rain forest setting; and the Math Blaster series, which provides practice with a range of math skills in the context of outer space adventure scenarios. 15 Van Dusen and Worthen (1995) Managing the Integration of Technology into Instruction with Classworks™ Engaging logic-based exploration activities and games include programs such as Mindplay's Ace Explorer™ series, in which students take the role of a reporter or detective to find clues to solve a problem, and Math for the Real World™, in which they learn how mastering real-world math problems leads to real-life success. These programs not only promote knowledge in specific skill or content areas, but also help develop students' reasoning and information processing skills. Classworks also provides ample opportunities for reading and writing experience. For example, Story Club™ presents literature in an interactive, multisensory context and provides the tools for students to draw, write, or record their ideas and feelings about what they've read. For guidance throughout the writing process, there is Media Weaver, which offers a text and multimedia word processing environment that enables students not only to write and revise their work, but also to illustrate and publish it. Other open-ended software tools for students include The Cruncher, which integrates a full-powered spreadsheet with interactive, multimedia tutorials that teach students how to use spreadsheets and graphs in everyday life; and multimedia presentation titles such as The Multimedia Workshop and HyperStudio.

Information resources, such as the multimedia U.S. history database included in Vital links, are also available for independent and directed student exploration. These software programs promote effective learning and stimulate interest through a combination of captivating multimedia presentation of content, a variety of interactive formats, and extensive help and support systems. Additionally, Classworks can be expanded to include network versions of almost any third-party program. Taken together, the library of Classworks programs and the additional third-party resources teachers can add to the system help to make learning both challenging and enjoyable. Support for Special Needs Students. Because Classworks gives teachers the flexibility to tailor instruction, they can adapt the predefined instructional units to create units that meet a variety of individual needs. The number and range of software titles in the Classworks library provides teachers with resources that appeal to students with many different learning styles. As one superintendent noted, this flexibility is an important benefit in working with special needs students: Classworks accommodates students with all ability levels and varying learning styles. Classroom teachers are able to control the degree of difficult and mastery level to meet the individual needs of gifted as well as special needs students.16 By offering a structured sequence of units and activities, Classworks can provide needed support for students who are behind academically, under-challenged, or undermotivated, or who may have other special needs. 16 Comment by Dr. Donald Tylinski, Superintendent, Freeport Area School District, Freeport, Pennsylvania, in a Classworks user survey Managing the Integration of Technology into Instruction with Classworks™

CLASSWORKS AND BEST PRACTICES IN COMPUTER INTEGRATION

"Best practices" are defined as those instructional methods that help students communicate, provide highly visual learn-

ing environments, make it safe for students to ask questions and make mistakes, and help students develop thinking skills by solving real-world problems. (Loeterman and Harkins, 1996) Instructional approach and systemic approach have been identified as two key elements of best educational practices. With respect to instructional approach, best practice programs promote and implement a "hands-on/minds-on" approach that includes investigation, discovery, and application. (Ruskus and Luczak, 1995) From a systemic perspective, best practices means that program content and activities align with curriculum, instruction, assessment; with national and state standards; with district . . . frameworks; with school/district strategic plans; and with other change efforts. (Ruskus and Luczak, 1995) How does Classworks satisfy these criteria? Activities in each unit include a wealth of hands-on interactive approaches, each of which stimulates student thinking in a different way. Learning environments in the Classworks products are intensively visual, utilizing to its fullest the computer's graphic potential, while a broad array of help features provides consistent support and makes the computer a safe place for student learning. Projects in each unit include a variety of "hands-on/minds-on" dynamic activities that provide opportunities for students to integrate their understanding and apply knowledge to real-world problems. Such projects also provide natural environments and opportunities for communication, particularly when they incorporate the use of communication tools such as word processors and multimedia presentation programs. For example, in a Classworks project entitled "It's a Zoo Out There!" third grade students work in groups of five to plan for a new zoo. Based on data about populations of animals they plan to acquire for the zoo, students use The Cruncher to prepare an illustrated spreadsheet complete with for-

mulas. When they have completed their analysis, they create and can share a graphic display of various habitat designs for selected animals.

Not only does Classworks meet the criteria for best practices in instructional methods and approaches, it also performs admirably when judged according to Ruskus and Luczak's systemic criterion. Classworks instructional sequences—units and activities—have been designed to align closely with the standard elementary curriculum. Correlation to specific local, state, and/or national standards is easily accomplished, since each unit and the activities within it are matched to an objective. Additionally, teachers can easily create their own activities in Classworks, incorporating documents and files from third-party products to fill any gaps there may be in the coverage of specific standards used by the school or district. As one district administrator reported, "We were looking for a package that matched the New York State standards and was a good instructional match with our curriculum, and we felt that Classworks fit the bill. . . . We don't allow anything to   dictate the curriculum to us, and you don't have to be lock step in a pre-designed curriculum with this system. The teachers can choose what they want—they have a lot of flexibility." 17 17 Comment by Cathy House, Language Arts/Reading District Coordinator, Wilson Central School District, Wilson, New York, in a Classworks user survey Managing the Integration of Technology into Instruction with Classworks™

CONCLUSION

This paper has focused on how and why Classworks can meet a school district's need to manage the integration of computers into instruction. By combining the range and quality of stand-alone software with the effectiveness of integrated learning systems, Classworks provides the best of both worlds in instructional technology. For teachers new to technology, it provides an easy way to get started. Classworks places students into a sequence of well-defined instructional units consisting of activities drawn from its vast library of more than 150 titles. The versatility of the software used to create the activities—including many well-respected, award-winning product titles—provides a wide variety of different interactive environments. Linking the same objective to multiple activities in a unit increases the chances that a student will master the objective. Classworks' sophisticated management system makes it easy for teachers to keep records and manage student assignments. Teachers can access reports on each student's progress and performance. They can use the reports to make decisions about how and when to intervene. And because each unit in Classworks is linked to an objective, the units and the activities within them can easily be correlated to textbooks and to local, state, and/or national standards.

Additionally, there is the capability of adding third-party software to Classworks and creating customized sequences of units and activities. Adding software is easy using the Curriculum Editor, and Classworks makes it possible for teachers to access and evaluate the work files students have created. Using the Classworks instructional management capabilities, teachers and students can meet and exceed the content and performance requirements specified in national standards documents. To fulfill the promise of effective integration of technology into instruction, teachers must have access to the very best educational software and the means to organize and connect it to their instructional goals. The educational titles within Classworks give teachers access to software that educators and parents have consistently chosen as among the best in instructional technology. The design of the curriculum sequences provides a coherent, instructionally integrated scope and sequence, with the flexibility teachers need to tailor and customize that curriculum to meet the needs of their students. Additionally, the management system provides the freedom for teachers to supplement the Classworks curriculum sequences by adding other third-party software products to meet their instructional goals. In all these ways, Classworks supports school districts in fulfilling the promise of technology as an effective tool to promote and enhance student learning. Managing the Integration of Technology into Instruction with Classworks™

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RESEARCH-BASED DESIGN AND BEST PRACTICES IN CLASSWORKS

In ensuring the effectiveness of instructional technology, indeed any instructional methodology, a review of research and best practices is critical. This background provides a purposeful approach to Classworks instruction, and gives educators confidence that by using a research-based solution students are given the best opportunity to learn.

Classworks is developed and organized to provide a research-based format and structure for delivering instructional software. This is accomplished based on research proven practices in three general areas:

- Organization and Instructional Design
- Content Alignment for Relevant Instruction
- Best Practices in Content and Delivery

The discussion that follows examines all three areas in detail and describes how Classworks utilizes proven methods of instruction so as to provide rich, relevant content designed to maximize student learning.

ORGANIZATION AND INSTRUCTIONAL DESIGN

Classworks units are constructed and maintained so they will provide meaningful activities using research-based methods and strategies. The framework for the units includes mini lessons, practice activities, review activities, posttests, and projects. Within this framework Classworks incorporates a significant variety of activities that utilize the proven methods and strategies that the framework can provide.

Each part of the framework contributes important elements to the instructional effectiveness of the unit as a whole. Below are details of the unit components along with examples of how Classworks weaves them all together.

Mini Lessons:
  Mini lessons provide three instructionally effective elements to the unit – learn, apply and review. They are designed to provide an anticipatory set or a tutorial, a way to teach the designated objective for the unit. Visual, audio, and textual examples and models are utilized. The 'learn' section has the initial delivery of instruction, including all content required to learn the concept. The application section of the lesson is for practice where consistent feedback is given. The third piece of the mini lesson is the review, including all key concepts that will be assessed.

  Placement of mini lessons at the beginning of units is an effective way to provide initial instruction, application and review through a springboard activity. It also uses elements of Madeline Hunter's widely used framework on lesson design.

Practice Activities:
  Practice activities engage students in numerous ways to practice a skill. By integrating multiple activity types into each unit while focusing in a single skill, students have an opportunity to see different instructional approaches and learning styles. Often, a particular approach will engage a student and learning will take place more quickly, or

with a longer retention of knowledge. Ongoing feedback is provided, encouraging greater student attention, interest, and increased understanding. In many cases direct instruction, helpful hints and tips are provided during the lesson.

Many practice activities provide opportunities for developing higher-order thinking skills. The sequential placement of activities within a unit requires students to use increasingly complex thinking as they proceed through the unit. Students are required to use application, analysis, and synthesis skills (Webb's Depths of Knowledge and Bloom's Taxonomy). Lessons require solving puzzles, comparing and contrasting, summarizing, supplying answers from context clues, creating examples, and writing stories. Robert Marzano in What Works in Schools: Translating Research into Action looks at research that shows what activities give greater results. Two areas that rated the highest in his studies for higher order thinking are comparing and contrasting, and summarizing – both frequently represented in Classworks instruction.

Following are some specific examples: Math Shop Deluxe activities on fractions require students to determine how to divide the cookies up given certain preset parameters. Multiple steps, requiring thoughtful consideration, are required to come to a correct answer. In Reading Gladiator a student must 'recognize relationships' to match words in rows with corresponding words in columns using different categories. Clues are available throughout the lesson. Jump-Start Phonics' Storybook Cave is an activity that has the student find the correct word to fill in the blanks based on the context of the rest of the sentence. Hints are available in several spots within the screens of this lesson. Many comprehension activities require understanding of the main idea, the details, or ask for a summary. The Tom Snyder Graph Club lessons teach students how to make a graph and then lets students create and explore their own data and graph. The JumpStart Phonics Beehive Activity works the student through activities where he or she matches correct short vowel sounds with the correct word. The student can listen to the words and their sounds and compare those sounds with the vowel sound that is given. In addition, many writing (practice) lessons have students complete directed writing activities while others create open ended writing projects.

Another highly rated strategy for achieving results is practice with non-linguistic representation (including instructional software). Classworks is rich in non-linguistic representation of concepts supporting this methodology.

Review Activities:
Optional activities are provided in many of the units for additional practice through more concrete and simplified materials. Students that are not able to understand objectives at the assigned level can do lessons that are more instructionally appropriate, while still focusing on the same standard or skill as their peers. Built into the Classworks manager is the capability to automatically trigger review activities based on non-mastery, or for teachers to specifically assign this instruction. This mecha-

nism provides tools for stronger accountability and instructional appropriateness.

Quizzes:

Quizzes are the assessment piece of Classworks units and give a formative assessment following the mini lessons and practice activities. Results are easily measured and immediate accountability is available to students, teachers, and administrators. Tested concepts come from the unit objectives. Quiz results assist with needed feedback and can help to drive instruction.

Projects:

Projects are the culminating activity of each unit. Performance-based projects provide an opportunity to show real world application and critical thinking related to the skills learned to demonstrate mastery. They are open-ended activities that use one of four software applications (Writing Blaster, Multi-Media Workshop, HyperStudio, and Cruncher). These activities provide for student creativity, student writing, and the resources to apply things that were learned in the unit.

Classworks projects are fully integrated into the instructional units. This ensures that they are aligned to state standards and developed around specific skills and concepts — adding depth and breadth to the instructional path instead of existing as a separate piece outside of the student's regular learning process. Projects readily enable the more highly effective instructional strategies and require complex levels of thinking as well as varied levels of evaluation.

Results/Reports:

Immediate feedback assists in the learning of conscientious learners and teachers. Classworks provides immediate feedback throughout the lessons. On top of that the management system also generates reports. These results can be in summary or detailed formats. Research shows how when timely feedback is given for student activity, learning improvement is measureable. Classworks provides information on what activities the students have worked on, their accompanying scores, engaged time on task, and date of completion. Again, the data is a key resource to direct instruction. Robert Marzano in What Works in Schools: Translating Research into Action (p. 37) talks about the need for ongoing feedback, especially teacher to student feedback. He shows how reinforcing and recognizing is another one of the more highly effective practices for seeing results. Another report showing to the importance of results in direct relation to learning is How Full is Your Bucket by Tom Rath and Donald O. Clifton. Classworks reports address the concerns outlined in both of the above works.

The ability to base instructional decisions on data is a critical piece of the puzzle to provide the most relevant, effective instruction to every child. Classworks reports give educators the tools they need to make informed decisions and adjust assignments accordingly.

CONTENT ALIGNMENT FOR RELEVANT INSTRUCTION

Classworks' sequences are organized with sets of units by grade level and content area to the most appropriate local, state

and national standards. The fundamental components of instructional sequences are the units. Curriculum Advantage constructs each sequence with the units aligned to the required standards.

National Alignment:
Foundational sequences are developed for each grade level and content area from a national perspective. Instructional strands and objectives are identified and included from state and national resources. These national sequences become the basis from which other more specific alignments are drawn. Our commitment has been and continues to be to maintain comprehensive, robust national sequences.

Standards from the National Council of Teachers of Mathematics, the National Council of Teachers of English, the International Reading Association and the National Assessment of Educational Progress were used in building the scope and sequence and organizing Classworks instruction.

The National Reading Panel's report and summary on Teaching Children to Read: An Evidence-based Assessment of the Scientific Research Literature on Reading and its Implications for Reading Instruction, 2000, was used for both validating and aligning the instructional materials. As the basis for the Reading First essential components of reading, we have gathered a comprehensive set of materials to meet the underlying objectives of phonemic awareness, phonics, fluency, vocabulary, and comprehension.

The recent findings of the National Math Panel, Foundations for Success, 2008 are reinforced with Classworks instruction. The purpose of this panel was to lay out a

framework for effective mathematics instruction, with a particular focus on preparation for success in Algebra.

Some of their relevant findings included:

- K-8 content must be streamlined with more depth on fewer key topics
- The foundation skills for algebra are whole numbers, fractions, geometry concepts and measurement
- A much greater emphasis must be placed on fractions in American schools
- Early exposure (Pre-K through 2) to math is critical and has a lasting impact

Classworks has extensive instruction in the four foundation skills, and is particularly strong in the area of fractions, which was found to be the greatest weakness in current learning.

Classworks also takes into account NCTM's Curriculum Focal Points which derive from some of the same concerns that appeared in the NMP Report. The Focal Points are three identified targets at each grade level that are recommended for in-depth content emphasis. This means that the vast majority of teaching and learning at each grade level would center on the focal points – with the goal of real learning that is retained and provides a solid mathematical foundation for future success.

State Alignments:
Curriculum Advantage creates state-aligned sequences to keep content relevant to local and state needs and to help in meeting state accountability requirements. From the national sequences we draw the specific units together that a

state requires through their standards and assessments.

Classworks state editions are directly aligned to:

- Specific state developed standards
- State test objectives

This allows individual learning paths to be created based on those standards and/or objectives so that each student can work on their state-determined areas of need. Student progress against the standards is measured and reported through Classworks Manager.

When working with the standard alignments, students may be assigned on grade level Classworks content for standard mastery. When working with state high-stakes test objectives or assessment result imports, learning paths have content for remediation, on grade level, or enrichment, according to individual areas of need.

Each year Curriculum Advantage reviews the changes in standards and assessments in order to update any state's aligned material, helping to maintain consistency when a state is transitioning to new standards and state tests. This can be critical in supporting educators, especially when textbook adoptions lag behind state changes and new materials are required.

Import and Benchmark Features:
Two of the Classworks features, imports and benchmark assessments, deliver individualized, prescriptive assignments for students. Student assignments are customized to the individual student's needs based on results. If a student did not do well in measurement, the lessons for that specific area are assigned. The next stu-

dent could be assigned something very different depending on the specific needs.

Import assignments are generated from outside testing data that can be imported into the Classworks manager, generating a unique assignment for each student. This data comes from the results of a state's criterion-reference high-stakes test, or from a local or third-party assessment. The ability to import assessments used by the district offers two advantages: 1) Student assignments are derived from state assessments which are more meaningful in terms of accountability to state standards, and 2) Student assignments are derived from assessments already being used so that additional time does not have to be spent on assessments, but can be devoted to instruction and learning.

The Classworks Benchmark Assessment is designed to measure student concept and skill mastery, and automatically prescribes an individual learning path of Classworks instruction based on the results. Test items are valid and reliable nationally normed items, covering grades 3-10. The items are organized into strands and skills that have been aligned to Classworks units that provide instruction to help students master the concepts. Benchmark assessments are created to match curriculum maps or pacing guides, and to let the teacher assess for the objectives he/she chooses at the appropriate time. Students take the test on those objectives and the results determine the lessons that will be assigned to each student based on results. These features allow teachers to assign instruction based on each student's individual needs.

BEST PRACTICES IN CONTENT AND DELIVERY
While there are tens of thousands of writ-

ings on pedagogy and instructional methodologies, clearly some effective practices have been noted by both the experts and practitioners alike. This core group of recognized "best practices" has been proven effective in both teaching and learning, and in having an impact on student achievement.

Classworks can be viewed through the lens of "best practices" as a way of helping educators use the flexibility of the management system and depth and breadth of the instruction to maximize student learning.

Following are some of the most common and proven practices, evidenced by research, that are integrated into Classworks Instructional Delivery:

Effective Instructional Design

The framework design of Classworks' units incorporates a sound instructional process. The Classworks' framework, similar to Madeline Hunter's Elements of Lesson Design, maintains the integrity of the objective and the level and flows from the introduction, to the tutoring, then the practicing, the assessing, and extending.

Beyond the unit framework there is a significant variety of activity types. One recognized strategy for helping students to learn an objective well is to teach it to them in a variety of ways. With Classworks that technique can be easily practiced.

Differentiation Capabilities

Classworks differentiates in a variety of ways. Within the instruction, each unit provides differentiation by presenting students with multiple instructional approaches to the skill or concept. On a broader scale, each student's instructional learning path is differentiated from every other's, targeting instruction that is relevant to their needs. Finally, the Classworks import, benchmark, and management tools enable the teacher to assign individualized, instructionally appropriate activities. With a balanced, teacher-directed use of these tools this technology can be very helpful, very powerful, and the results measureable. Researchers and authors like Fullan, Schmocker, Marzano and others emphasize that the key to these types of assignments is that they be teacher directed.

Cognitive Complexity

Higher-order thinking by students involves the transformation of information and ideas. Development of higher order thinking begins with the ability to understand concepts and ideas, and moving to increasingly complex thinking wherein students apply what is learned in new and unusual ways.

There is voluminous research and a variety of instructional models that describe complex thinking. These include the Rigor and Relevance Framework by the International Center for Leadership in Education, Benjamin Bloom's Bloom's Taxonomy as well as Bloom's Revised Taxonomy, and Norman Webb's Depth of Knowledge. These models provides educators with a structure which can be used to build curriculum materials that take learners more deeply into any area of study and ensure a more complete understanding of a concept.

Classworks supports higher order thinking skills in a number of ways. The or-

ganization of the instructional unit itself is designed to go from simple knowledge of a skill or concept to a more complex understanding. The use of multiple, third-party titles also ensure that students will be asked to demonstrate understanding in a number of ways – touching on all levels of thinking. In addition to the higher order thinking skills instruction integrated throughout the Classworks activities, Classworks provides performance-based projects, specifically designed to demonstrate complex levels of cognitive thinking. These are standards-based projects – integrated into the instructional unit and focused on each specific skill or concept - designed to demonstrate mastery and real world relevance.

High Curricular Standards

State sequences are aligned to meet the highest instructional requirements of that state. In addition to these state standards, Curriculum Advantage researches and utilizes guidelines and recommendations from national sources. Some of these resources include: the report by the National Reading Panel on Teaching Children to Read, the Put Reading First: The Research Building Blocks for Teaching Children to Read document, the National Mathematics Advisory Panel's Foundations for Success Report, the Reading First guidelines, and policy items from the Center for Education Policy. Some other sources reviewed and considered are the standards outlined by the National Assessment of Educational Progress and the National Council of Teachers of Mathematics, the National Council of Teachers of English, and the International Reading Association.

Use of Technology

Summarizing the reviews of research on computers and education, Fouts indicates that the vast majority reach positive conclusions about their efficacy. He reports general concurrence that:

- When combined with traditional instruction, the use of computers can increase student learning in the traditional curriculum and basic skills areas.
- The integration of computers with traditional instruction produces higher academic achievement in a variety of subject areas than does traditional instruction alone.
- Students learn more quickly and with greater retention when learning with the aid of computers.
- Students like learning with computers and their attitudes toward learning and school are positively affected by computer use. The use of computers appears most promising for low achieving and at-risk students.
- Effective and adequate teacher training is an integral element of successful learning programs based on or assisted by technology.

The National Math Panel reports that high quality computer-assisted instruction does "improve students' performance compared to conventional instruction."

Some key elements in Classworks that are critical to effective computer-assisted instruction include:

- Plenty of opportunities for practice of skills and concepts
- Use of well-designed tutorials are used to introduce content
- Targeted instruction to develop spe-

cific concepts

Frequent Reporting and Monitoring

Data that is gathered as students work provides relevant feedback. A teacher's timely management of these results allows for the 'dollops of feedback', that researcher Robert Marzano encourages. From the student perspective, they receive feedback after every activity for encouragement during their self-paced learning. In addition, students have access to view their results at any time for individual feedback. Research shows that meaningful feedback generates improved results.

Sound Implementation Strategies

Effective implementation of instructional software is just as important as the quality of the content, the structure of lessons, or the comprehensiveness of the coverage. Implementation includes training, support, goals and planning, how much time is dedicated, and what strategies are utilized. Each of these components contributes to the success of the software. When teachers are trained well, given ongoing support, and implement their plans and goals with fidelity, the implementation is more successful. Adequate instructional time, focus on relevant standards, and a commitment to meaningful feedback are other critical factors.

Some instructional strategies are more effective than others. Robert Marzano's, What Works in Schools: Translating Research into Action highlights a number of these techniques and what kinds of results they can generate. Some of the strategies he recommends are identifying similarities and difference, using summarizing, reinforcing efforts and success, assigning

homework and practice lessons, giving feedback, and using non-linguistic resources. The strategies he identifies are in use throughout the Classworks software.

Classworks has also been integrated into specific implementation models where it can be a critical component of a larger school reform effort. Some of these models include Response to Intervention, Value-Added Accountability Models, 21st Century After School Programs, and the Continuous Improvement Model.

CONCLUSION

Classworks recognizes the importance of making informed instructional decisions to give students the best opportunity to learn. By creating instruction that is based on proven best practices and sound instructional design, educators can be confident that they are providing quality, research-based computer assisted instruction that will impact student achievement.

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Rigor and Relevance Framework

Rigor and Relevance

For the highest levels of learning to occur, rigor – as evidenced through higher order thinking skills described in Bloom's Taxonomy – must be combined with relevance. The Rigor/Relevance Framework is a tool developed by the International Center for Leadership in Education to examine curriculum, instruction, and assessment. The Rigor/Relevance Framework is based on two approaches to instruction, learning and student achievement.

Classworks, published by Curriculum Advantage, Inc., is modeled on these two instructional approaches to ensure the highest level of learning and student achievement.

The use of higher order thinking skills in curriculum and instruction is a way to demonstrate rigor, ensuring that instruction is providing the tools necessary to increase student achievement. Higher order thinking involves moving students from basic acquisition of knowledge to using that knowledge in complex and abstract ways. Bloom's taxonomy serves as the basis for measuring higher order thinking skills. This model includes six levels of thinking: knowledge, comprehension, application, analysis, synthesis and evaluation. This provides educators with a structure that takes learners more deeply into any area of study and ensures a more complete understanding of a concept. A breakdown of the six levels of Bloom's Taxonomy is appended at the end of this document.

Classworks – Rigor and Relevance

Classworks supports higher order thinking skills throughout the curriculum. The organization of the instructional unit itself is designed to go from simple knowledge of a skill or concept to a more complex understanding. Starting with the mini-lesson providing knowledge and application, through the activities and projects bringing all students to real-world demonstrations of understanding, Classworks provides both rigor and relevance.

The use of multiple, third-party titles also ensures that students will be asked to demonstrate understanding in a number of ways – with different activities requiring the student to use different levels of thinking from simple knowledge responses to complex evaluation and judgments. The combination of these activities increasing in complexity as the student progresses through the instructional unit follows the Bloom's taxonomy model and ensures rigor.

In addition to providing rigorous instruction, all instruction is tightly aligned to state standards, ensuring that content is relevant to each student based on classroom instruction while focusing on their individual areas of need.

Classworks specifically requires students to use the higher order thinking skills - analysis, synthesis and evaluation - by eliciting responses through different question types, requiring demonstration of specific skills, and having students apply knowledge to show mastery. Below are specific examples of the question types, skills, and application of knowledge at each of the three highest levels.

Analysis in Classworks
- Question types: analyze, separate, order, explain, connect, classify, arrange, divide, compare, select, explain, infer
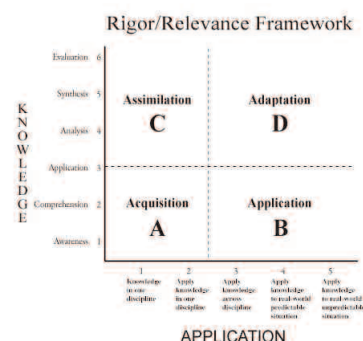
The Rigor/Relevance Framework is based on two approaches to instruction, learning and student achievement. Higher order thinking skills from Bloom's Taxonomy is coupled with 'how knowledge is applied or put to use' to create this sound instructional approach.

- Skills demonstrated:
  - Seeing patterns
  - Organization of parts
  - Recognition of hidden meanings
  - Identification of components
- Mastery level application
  - Applying Order of Operations to get highest possible mathematical result
  - Seeing and organizing patterns and the relationship between symbols and numbers
  - Analyzing component pieces of information and make inferences about relationships
  - Ability to disregard extraneous information

Synthesis in Classworks
- Question types: combine, integrate, modify, rearrange, substitute, plan, create, design, invent, what if?, compose, formulate, prepare, generalize, rewrite
- Skills demonstrated:
  - Use old ideas to create new ones
  - Generalize from given facts
  - Relate knowledge from several areas
  - Predict, draw conclusions
- Mastery level application
  - Ability to look at a variety of different facts and relate them together to predict the correct outcome
  - Draw conclusions based on previously learned information
  - Studying causes and predicting what the effect will be, and conversely to look at an effect and select the most likely cause
  - Demonstrating more than one way to solve a problem and arrive at the correct conclusion

Evaluation in Classworks
- Question types: assess, decide, rank, grade, test, measure, recommend, convince, select, judge, explain, discriminate, support, conclude, compare, summarize
- Skills demonstrated:
  - Compare and discriminate between ideas
  - Assess value of theories, presentations
  - Make choices based on reasoned argument
  - Verify value of evidence
  - Recognize subjectivity
- Mastery level application
  - Judge the consistency of literary works based on universal use of such concepts as the hero, classic conflicts, overcoming challenges
  - Evaluation of reasoned arguments as well as the value of supporting arguments
  - Determination if a claim is supported by evidence

Classworks Projects
In addition to the higher order thinking skills instruction integrated throughout the Classworks activities, Classworks provides performance-based projects, specifically designed to demonstrate high levels of cognitive thinking. These are standards-based projects – integrated into the instructional unit and focused on each specific skill or concept - designed to demonstrate mastery and real world relevance. As students demonstrate knowledge in real-world settings, depth of knowledge and ability to use knowledge in complex ways is evident and measurable.

Each Project requires students to demonstrate their knowledge in more complex ways. Projects include:
- Performance-based process – students SHOW what they know
- Real world application – understanding is shown within a context that occurs in real life – they answer for themselves, "When will I ever use this?"

- Multimedia tools –allow students to create presentations for evaluation
- Demonstration of mastery – students don't practice a skill in a vacuum – they apply the just-learned skill to show that they understand it
- Cross-curricular connections – showing how content knowledge applies in a variety of ways
- Worksheets and instructional tools - to show step by step process of learning
- End product - for the student digital portfolio

By using the Classworks instruction, educators know that both rigor and relevance are integrated to match instruction, assessments and curriculum to the needs of their learners.

Appendix A – Bloom's Taxonomy

Knowledge

Knowledge is defined as the remembering of previously learned material. This may involve the recall of a wide range of material, and represents the lowest level of learning outcomes in the cognitive domain.

> Examples of learning objectives: know common terms, know specific facts, know methods and procedures, know basic concepts, know principles

Comprehension

Comprehension is defined as the ability to grasp the meaning of material. This may be shown by translating or interpreting material.

> Examples of learning objectives: understand facts and principles, summarize verbal material, interpret charts and graphs, estimate future consequences

Application

Application refers to the ability to use learned material in new yet concrete situations. This may include the application of such things as rules, methods, concepts, principles, laws, and theories.

> Examples of learning objectives: apply concepts and principles, solve mathematical problems, construct graphs and charts, demonstrate correct usage of a procedure

Analysis

Analysis refers to the ability to break down material into its component parts so that it may be understood. This may include the identification of parts, analysis of the relationship between parts, and recognition of the organizational principles involved.

> Examples of learning objectives at this level are: recognize unstated assumptions, recognize fallacies in reasoning, distinguish between facts and inferences

Synthesis

Synthesis refers to the ability to put parts together to form a new whole. This may involve the production of a unique communication, a plan of operations, or a set of abstract relations.

> Examples of learning objectives: write a well organized theme, give a well organized speech, writes a creative short story, propose a plan for an experiment

Evaluation

Evaluation is concerned with the ability to judge the value of material (statement, novel, poem, research report) for a given purpose. The judgments are to be based on definite criteria.

> Examples of learning objectives: judge the logical consistency of written material, judge the adequacy with which conclusions are supported by data, judge the value of a work (art, music, writing) by the use of internal or external criteria and standards of excellence.

Cognitive complexity involves thinking on a deeper level, rather than just memorizing facts or understanding material. It means building on previously learned information to think about problems in alternative ways and to develop new solutions. This includes a mixture of critical and creative thinking and requires both reasoning and innovation.

We think of complex thinking as "higher-order thinking" because it causes the person to make nuanced judgments about situations and to look for new meaning through different perspectives and assumptions. This compels learners to further
engage in self-directed, complex thinking and results in those who are better able to make evaluations, decisions and offer creative solutions.

Complex thinkers have an advantage in the global workforce of the 21st Century, with skills that help them excel in positions of leadership, strategic planning, communication and management. It is critical to ensure the students of today have the tools to be the leaders of tomorrow.

Depth of Knowledge	Classworks
Recall - Recall of a fact, information, or procedure • Use a dictionary to find the meaning of a word • Identify figurative language in a passage **Question Cues:** Repeat, recall, recite, recognize, tell, state, arrange, calculate, define draw, identify, list, label, illustrate, measure, report, quote, match, use, tabulate, state, memorize, name, who, what, when where, why	**Mini-lessons, Activities** • Recall elements and details of story structure, such as sequence of events, character, plot, and setting • Conduct basic mathematical calculations • Label locations on a map • Represent concepts or relationships or perform routine procedures • Describe the features of something **Classworks Sample Activities** • Using a Dictionary- Grade 1 • Multiply Fractions- Grade 8 • Introducing Final Consonants - Grade 1 • Subtracting Using Mental Math- Mini Lesson- Grade 4 • Using Basic Facts up to 9x9- Grade 4 • More Rounding Decimals- Grade 7 **Projects** • Make a timeline • Make a story map • Name the characters in the story • Illustrate the main idea or sequence of events • Write an outline • Make a coloring book

Depth of Knowledge	Classworks
Basic Application of Skill/Concept - Use of information, conceptual knowledge, procedures, two or more steps, etc • Use context cues to identify the meaning of unfamiliar words • Predict a logical outcome based on information in a reading selection • Identify and summarize the major events in a narrative **Question Cues:** Graph, classify, separate, cause/effect, estimate, compare, relate, infer, categorize, collect and display, identify patterns, organize, construct, modify, predict, interpret, distinguish, use context cues, make observations, summarize, show	**Mini-lessons, Activities, Projects** • Identify and summarize the major points • Identify meaning of unfamiliar words from context clues • Solve routine multi-step problems or identify patterns • Describe cause and effect relationships • Formulate routine problems from provided data • Organize and interpret data **Classworks Sample Activities** • Learning About Context Clues- Grade 2 • Summarizing, Paraphrasing, and Plagiarizing- Grade 7 • Introducing Congruent and Similar Figures; Activity 1- Grade 3 • Skill Builder: Reading Comprehension 7-3- Grade 7 • Multiplying up to 3-Digit Multipliers- Grade 3 • Understanding Verb Tenses- Grade 5 **Projects** • Write and perform a play • Make a map • Paint a mural • Construct a model • Make a puzzle or game • Write a diary or journal entry
Strategic Thinking - Requires reasoning, developing a plan or sequence of steps; has some complexity; more than one possible answer; generally takes less than 10 minutes to do • Determine the author's purpose and describe how it affects the interpretation of a reading selection • Summarize information from multiple sources to address a specific topic • Analyze and describe the characteristics of various types of literature **Question Cues:** Revise, apprise, critique, formulate hypothesize, cite evidence, differentiate, investigate, compare, construct, assess, develop a logical argument, draw conclusions, use concepts to solve non-routine problems, explain phenomena in terms of concepts	**Activities, Projects** • Provide supporting details and examples • Identify author's purpose, the audience, and provide interpretations • Generate research questions and design investigations • Develop a scientific model for a complex situation • Apply a concept in some other contexts **Classworks Sample Activities** • Exploring Author's Purpose- Activity 1- Grade 8 • Equal Amounts with Different Coins- Grade 1 • Skill Builder- Interpret and Compare Graphs- Grade 4 • Skill Builder: Reading Comprehension 7-3- Grade 7 • Exploring Types of Expository Writing- Grade 7 • Stem-and-Leaf Plots- Grade 8 • Comparing and Ordering Numbers to 100- Activity 1- Comparing Numbers- Grade 1 • Making Change- Grade 3 **Projects** • Use a Venn Diagram • Design a questionnaire • Construct a graph • Review a work of art or literature • Prepare a report • Analyse the results of a survey

Depth of Knowledge	Classworks
Extended Thinking - Requires an investigation; time to think and process multiple conditions of the problem or task; and more than 10 minutes to do non-routine manipulations • Analyze and synthesize information from multiple sources • Examine and explain alternative perspectives across a variety of sources • Describe and illustrate how common themes are found across texts from different cultures **Question Cues:** Design, connect, synthesize, apply concepts, critique, analyze, create, prove	**Activities, Quizzes Projects** • Conduct projects that require articulation of a problem, the design, the data analysis, the results, and solutions as well as actually carrying it out • Apply a mathematical model demonstrate a model a problem • Analyze and synthesize information from various sources • Identify and illustrate the common themes of texts from various cultures • Design mathematical models for solving practical and abstract situations **Classworks Sample Activities** • Exploring Drawing Conclusions- Project- Grade 8 • Introducing Misleading Statistics- Mini Lesson, activity, and project- Grade 8 • Design, connect, synthesize, apply concepts, critique, analyze, create, prove • Using Signal Words to Compare and Contrast- Project- Grade 5 • Skill Builder- Introducing Elapsed Time- Grade 2 • Understanding Propaganda and Fact- Activity- Presenting More Propaganda- Grade 8 • Solving Problems by Drawing a Picture- Grade 3 • Double Line Graphs - Grade 6 • Understanding Narrative Writing- Project- Grade 6 • Identifying Setting- Grade 6 **Projects** • Debate a topic • Write a persuasive speech • Evaluate a character's actions • Prepare a list of judging criteria • Create a new product and plan a marketing campaign • Develop a menu and plan the opening of a new restaurant

Cognitive complexity involves thinking on a deeper level, rather than just memorizing facts or understanding material. It means building on previously learned information to think about problems in alternative ways and to develop new solutions. This includes a mixture of critical and creative thinking and requires both reasoning and innovation.

We think of complex thinking as "higher-order thinking" because it causes the person to make nuanced judgments about situations and to look for new meaning through different perspectives and assumptions. This compels learners to further engage in self-directed, complex thinking and results in those who are better able to make evaluations, decisions and offer creative solutions.

Complex thinkers have an advantage in the global workforce of the 21st Century, with skills that help them excel in positions of leadership, strategic planning, communication and management. It is critical to ensure the students of today have the tools to be the leaders of tomorrow.

Bloom's Taxonomy	Classworks
Knowledge - The recall and remembering of previously learned material. **Question Cues:** Repeat, recall, recite, recognize, tell, state, arrange, calculate, define draw, identify, list, label, illustrate, measure, report, quote, match, use, tabulate, state, memorize, name, who, what, when, where, why	**Mini-lessons, Activities** • Observation and Recall of information • Knowledge of dates, events, places • Knowledge of major ideas • Mastery of subject matter • Describe the features of something **Classworks Sample Activities** • Using a Dictionary - Grade 1 • Introducing Final Consonants - Grade 1 • Subtracting Using Mental Math - Mini lesson - Grade 4 • Using Basic Facts up to 9x9 - Grade 4 • More Rounding Decimals - Grade 7 **Projects** • Make a timeline • Make a story map • Name the characters in the story • Recite a poem

Bloom's Taxonomy	Classworks
Comprehension - Ability to process knowledge such that the knowledge can be reproduced or communicated; ability to grasp the meaning of material. **Question Cues:** summarize, describe, interpret, contrast, predict, associate, distinguish, estimate, differentiate, discuss, extend	**Mini-lessons, Activities** • Understanding information • Grasp meaning • Translate knowledge into new context • Interpret facts, compare, contrast • Order, group, infer causes • Predict consequences **Classworks Sample Activities** • Multiply Fractions- Grade 8 • Skill Builder: Reading in Science 6-1- Grade 6 • Identifying the Beginning, Middle, and End of a Story- Grade 1 • Understanding Main Idea and Details in a Paragraph - Grade 4 • Introducing Setting- Grade 5 **Projects** • Write a summary report • Illustrate the main idea or sequesnce of events • Write an outline • Make a coloring book
Application - Application- The use of abstractions and learned material in new and concrete situations. **Question Cues:** apply, demonstrate, calculate, complete, illustrate, show, solve, examine, modify, relate, change, classify, experiment, discover	**Mini-lessons, Activities** • Identify and summarize the major points. • dentify meaning of unfamiliar words from context clues. • Solve routine multi-step problems or identify patterns • Describe cause and effect relationships • Formulate routine problems from provided data • Organize and interpret data **Classworks Sample Activities** • Learning About Context Clues- Grade 2 • Summarizing, Paraphrasing, and Plagiarizing- Grade 7 • Introducing Congruent and Similar Figures Activity 1- Making Symetrical Figures A- Grade 3 • Skill Builder: Reading Comprehension 7-3- Grade 7 • Multiplying up to 3-Digit Multipliers- Grade 3 • Understanding Verb Tenses - Grade 5 **Projects** • Write and perform a play • Make a map • Paint a mural • Construct a model • Make a puzzle or game • Write a diary or journal entry

Bloom's Taxonomy	Classworks
Analysis - The breakdown of a situation into its component parts. **Question Cues:** analyze, separate, order, explain, connect, classify, arrange, divide, compare, select, explain, infe	**Mini-lessons, Activities** • Provide supporting details and examples • Identify author's purpose, the audience, and provide interpretations • Generate research questions and design investigations • Develop a scientific model for a complex situation • Apply a concept in some other contexts **Classworks Sample Activities** • Exploring Author's Purpose- Activity 1- Analyzing Author's Purpose- Grade 8 • Equal Amounts with Different Coins- Grade 1 • Skill Builder- Interpret and Compare Graphs- Grade 4 • Exploring Types of Expository Writing- Grade 7 • Stem-and-Leaf Plots- Grade 8 • Comparing and Ordering Numbers to 100- Activity 1- Comparing Numbers- Grade 1 • Making Change- Grade 3 **Projects** • Use a Venn Diagram • Design a questionnaire • Construct a graph • Review a work of art or literature • Prepare a report • Analyse the results of a survey
Synthesis - Putting together elements and parts to form a whole. **Question Cues:** combine, integrate, modify, rearrange, substitute, plan, create, design, invent, what if?, compose, formulate, prepare, generalize, rewrite	**Activities, Quizzes, Projects** • Use old ideas to create new ones • Generalize from given facts • Relate knowledge from several areas • Predict, draw conclusions **Classworks Sample Activities** • Using Signal Words to Compare and Contrast- Project- Grade 5 • Skill Builder- Introducing Elapsed Time- Grade 2 • Solving Problems by Drawing a Picture- Grade 3 • Double-line Graphs - Grade 6 • Exploring Drawing Conclusions- Project- Grade 8 **Projects** • Create a new product and plan a marketing campaign • Write a tv show or play • Design a new monetary system • Plan a new menu for a restaurant • Make up a new language • Plan the budget for opening a new business

Bloom's Taxonomy	Classworks
Evaluation - Judging the value of material for a given purpose **Question Cues:** assess, decide, rank, grade, test, measure, recommend, convince, select, judge, explain, discriminate, support, conclude, compare, summarize	**Activities, Quizzes, Projects** • Compare and discriminate between ideas • Assess value of theories, presentations • Make choices based on reasoned argument • Verify value of evidence • Recognize subjectivity **Classworks Sample Activities** • Understanding Propaganda and Fact- Activity- Presenting More Propaganda- Grade 8 • Understanding Narrative Writing- Project- Grade 6 • Identifying Setting- Grade 6 • Introducing Misleading Statistics- Mini Lesson, activity, and project- Grade 8 **Projects** • Use a Venn Diagram • Design a questionnaire • Construct a graph • Review a work of art or literature • Prepare a report • Analyse the results of a survey

Bloom's Revised Taxonomy represents a new look at the way we think and a valuable tool for designing curricula, instruction and assessments. At the heart of this new approach is an understanding that thinking is an active process, and the revised taxonomy reflects changes in terminology, structure, and emphasis. Instead of the traditional cumulative hierarchy found in the original Bloom's Taxonomy, we now understand that complex thinking is not a step by step process based solely on a specific verb, but rather it is a way to see the results of rigorous thinking at each cognitive level. No longer are there lower and higher thinking processes, but processes, regardless of the level, that require critical and sometimes creative thinking,

By renaming the different cognitive processes using active language – Knowledge becomes Remember and Comprehension becomes Understand – we more accurately describe the nature of thinking within each process. When we integrate these levels with the kinds of knowledge acquired – Factual, Conceptual, Procedural and Metacognitive – we have a two-dimensional framework that brings the thinking process into a clearer focus offering endless opportunities to integrate standards, objectives, assessments, activities and resources .

Using Bloom's Revised Taxonomy shows us that knowledge is not a form of thinking; it is truly a result of thinking. And when learners are required to think in complex ways, they move beyond "information gathering" to making meaningful connections that extend beyond the classroom. Because Classworks encompasses each dimension of thinking, we see students who actively engage in scaffolding their learning and assume responsibility for constructing knowledge. As a vital teacher resource, Classworks provides both rigor and relevance to support student thinking that extends beyond traditional time-based boundaries. Classworks makes learning more authentic and meaningful.

Bloom's Revised Taxonomy	Classworks
Remember - Retrieving relevant knowledge from long term memory - Recalling learned information **Student Outcomes** RECOGNIZING: Identifying RECALLING: Retrieving **Student Indicators** • Recognize the limitations of various forms of mathematical representations. • Recognize knowledge of spelling patterns • Locate an author's use of allusions and descriptive, idiomatic, and figurative language in a variety of literary texts • Locate a printed word on a page • Identify idioms in context. • Recall information presented orally • Identify common the fraction/decimal equivalents • Recall numbers, counting forward through 99 and backward from 10 **Question Cues:** List, memorize, recognize, identify, name, locate, re¬peat, label, recall, know, retrieve, define	**Mini-lessons, Activities** • Recall and repeat elements and details of story structure, such as character, plot, and setting • Recognize the roles of producers and consumers • Recognize print and nonprint media • Label locations on a map **Classworks Sample Activities** • Skill Builder – Letter Recognition, Grade 1, Cave Game – Letter Recognition (Recognize, name, find, locate) • Introducing Common Nouns, Grade 2, Identifying More Nouns (Recognize, identify) • Skill Builder - Place Value to 100, Grade 4, Value of Digits – Up to 4 Dig (Recognize, Identify) • Finding Equivalent Fractions Using Models, Grade 3, Equivalent Fractions 2 (Recognize, find, locate, know, define) • Figurative Language, Grade 5, entire unit (Recognize, name, type of elements used) **Projects** • Understanding Homophones, Grade 5, Fishing for Homophones (List 20 homophones) • Short Vowel a, Grade 2, Tracking the Short "a" (Recognize, identify, find, circle the short "a") • Introducing Skip-Counting, Grade 3, Penny Race (Know, repeat, recall) • Finding Equivalent Fractions Using Models, Grade 4, Circle the Wagons (Recognize, find, know, identify)

Bloom's Revised Taxonomy	Classworks
Understand - Constructing meaning **Student Outcomes** INTERPRETING: Clarifying, paraphrasing, representing, translating EXEMPLIFYING: Illustrating, instantiating CLASSIFYING: Categorizing, subsuming SUMMARIZING: Abstracting, generalizing INFERRING: Concluding, extrapolating, interpolating, predicting COMPARING contrasting, mapping, matching EXPLAINING, constructing cause and effect models **Student Indicators** • Clarify and refine a research topic • Illustrate the exchange of plants, animals, diseases, and technology throughout Europe • Conclude the cause of an event described in a text • Classify change over time as quantitative or qualitative • Interpret data in graphic displays • Translate between two-dimensional representations and three-dimensional objects • Find examples of sound devices • Paraphrase research information accurately **Question Cues:** Graph, demonstrate, convert, find, restate, discuss, describe, report, ob¬serve, represent, match, understand, give an example, relate, show, reproduce, quote, review, categorize, predict, summarize, interpret, infer, classify, compare, cause/effect, translate, show	**Mini-lessons, Activities, Projects** • Interpret and translate what has been learned • Summarize information for an audience • Classify objects by certain categories • Compare and contrast objects **Classworks Sample Activities** • Multiply Fractions, Grade 8, entire unit (Show, represent, understand) • Skill Builder: Reading in Science 6-1, Grade 6, entire unit (Describe, understand, summarize) • Identifying the Beginning, Middle, and End of a Story, Grade 1, entire unit (Show, describe, discuss, demonstrate) • Main Idea and Details, Grade 3, entire unit (Describe, understand, summarize) • Introducing Setting, Grade 5, entire unit (Show, describe, understand, give an example) **Projects** • Using Signal Words to Compare and Contrast, Grade 5, Vacation Planner (Compare and contrast vacations) • Finding Temperature, Grade 2, City Temps (Quantitative comparison of city temperatures) • Understanding Cause and Effect, Grade 3, How Did That Get There (Show, describe, or report cause and effect of land forms) • Interpreting Double Bar Graphs, Grade 7, Changing State Populations (Compare changing populations)
Apply - carry out or use a procedure **Student Outcomes** EXECUTING: Carrying out IMPLEMENTING: Using **Student Indicators** • Carry out simple scientific investigations when given clear directions • Use a rule to complete a sequence or a table. • Use functional text features • Use primary-source information • Apply knowledge of alphabetizing a series of words • Apply the procedures for data collecting and measuring weather conditions • Apply the formula v = d/t to solve problems related to average speed or velocity • Carry out left-to-right, top-to-bottom, and return-sweep directionality on the printed page **Question Cues:** Practice, utilize, use, carry out, employ, apply, perform, solve. Complete, execute, manipulate, compute	**Mini-lessons, Activities, Projects** • Solve routine multi-step problems. • Use transition words to show a sequence of events. • Employ alphabetical order on a group of words. • Utilize context clues to obtain more complete meaning. **Classworks Sample Activities** • Learning About Context Clues, Grade 2, entire unit (Use clues to discover complete meaning) • Introducing Congruent and Similar Figures, Grade 3, Making Symmetrical Figures A (Utilize, manipulate) • Skill Builder – Spelling Practice 7-3, Grade 7, Champion Practice #3 – Correct It – w/o Help (Practice, apply, complete) • Multiply up to 3-Digit Multipliers, Grade 3, entire unit (Compute, solve, complete using 3-digit multipliers) • Identifying Sequence by Using Signal Words, Grade 5, entire sequence (Using or employing signal or Transitional words) **Projects** • Solving Equations Using Multiplication and Division, Grade 7, Keep Your Balance (Solve one-step equations) • Introducing Missing Numbers, Grade 2, Hidden Treasure (Solve Addition/Subtraction problems) • Divisibility Rules: 2, 3, 5, Grade 4, Teamwork (Use divisibility rules to solve problems) • Exploring Words in Alphabetical Order, Grade 6, Scramble Winner's Dictionary (Alphabetize group of words) • Exploring Frequently Misspelled Words, Grade 8, Spelling Bugs (Practice spelling correctly)

Bloom's Revised Taxonomy	Classworks
Analyze - Breaking information into parts to explore understandings and relationships **Student Outcomes** DIFFERENTIATING: Discriminating, distinguishing, focusing, selecting ORGANIZING: Finding coherence, integrating, outlining, parsing, structuring ATTRIBUTING: Deconstructing **Student Indicators** • Analyze the meaning of words using affixes • Distinguish between the denotation and the connotation of a word. • Differentiate among points of view • Select information appropriate for the research topic • Differentiate between observation and inference • Organize data in charts, pictographs, and tables • Distinguish between categorical and numerical data **Question Cues:** Revise, calculate, diagnose, detect, discover, dissect, simplify, select, separate, diagram, examine, focus, outline, integrate, deconstruct, structure, organize, attribute, explore, survey	**Activities, Projects** • Provide supporting details and examples • Identify author's purpose, the audience, and provide interpretations • Generate research questions and design investigations • Develop a scientific model for a complex situation • Apply a concept in some other contexts **Classworks Sample Activities** • Exploring Author's Purpose, Grade 8, Analyzing Author's Purpose (Detect, discover, and discriminate author's purpose.) • Skill Builder - Equal Amount with Different Coins, Grade 1, Money – Counting Coins (differentiate, separate, attribute) • Skill Builder - Interpret and Compare Graphs, Grade 4, entire unit (Analyze, deconstruct, detect, diagram, examine) • Stem-and-Leaf Plots, Grade 8, Mini Lesson (Analyze, and calculate sets of data) • Making Change, Grade 3, entire unit (Discriminating selections of coins) • Skill Builder - Introducing Elapsed Time, Grade 2, entire unit (Analyze, examine, diagram, dissect, and calculate) **Projects** • Using Venn Diagrams, Grade 5, Mini Lesson, (Focus and outline ideas) • Working With Surveys, Grade 7, entire unit (Analyze, diagnose, and examine information from surveys) • Multiplication Facts for 10, 11, and 12, Grade 4, Cheaper by the Dozen (Calculate best prices) • Same Amount with Different Coins, Grade 2, Changing Coins (Differentiate and discriminate coin combinations for same amount) • Understanding Writing an Outline, Grade 5, The Outline Lifeline (Outline research on Native American culture) • Introducing Connotation and Denotation, Grade 8, Reading Between the Lines (Examine differences between denotation and connotation)
Evaluate - Make judgments based on criteria and standards **Student Outcomes** CHECKING: Coordinating, detecting, monitoring, testing CRITIQUING: Judging **Student Indicators** • Critique a conclusion drawn from a scientific investigation. • Judge the reasonableness of mathematical solutions • Justify answers on the basis of mathematical properties, structures, and relationships. • Validate conjectures with formal and informal proofs • Evaluate results of an investigation • Evaluate theses from informational texts **Question Cues:** Judge, rate, validate, assess, prioritize, evaluate, defend, deduce, debate, justify, recommend, rank, critique, prove, gauge, quantify, appraise, monitor, test	**Activities, Quizzes, Projects** • Analyze and synthesize information from various sources • Identify and illustrate the common themes of texts from various cultures • Make decisions based on criticism and assessment and be able to justify the decision **Classworks Sample Activities** • Understanding Propaganda and Facts, Grade 7, entire unit (Appraise, evaluate, and validate forms of propaganda) • Identifying Imaginary and Personal Narratives, Grade 4, Writing a Story and Narrating (Telling a Story) (Prioritize, evaluate, critique for appropriate components of narrative writing) • Identifying Setting, Grade 5, entire unit (Judging, evaluating, and validating elements of setting) • Introducing Misleading Statistics, Grade 8, Mini Lesson and project – (Defend and prove how changes to data can be misleading and change the meaning) **Projects** • Exploring Literary Elements, Grade 8, Authors Letter (Extension- Evaluate and critique story elements of student's writing to those of an author) • Fiction: Realistic, Historic, Science, and Fantasy, Grade 5, Critic's Corner (Critique and evaluate books) • Introducing Misleading Statistics, Grade 8, Statistics Never Lie – Or Do They? (Defend and prove how changes to data can change the meaning and be misleading) • Guessing and Checking, Grade 5, Check It? (Deduce, monitor, and validate answers) • Estimating Quotients, Grade 6, Printer Problems (Assess, deduce, recommend what to order)

Bloom's Revised Taxonomy	Classworks
Create - Put elements together to form a coherent whole, reorganize elements into a new pattern or structures **Student Outcomes** GENERATING: Hypothesizing PLANNING: Designing PRODUCING: Constructing **Student Indicators** • Create multiple-paragraph compositions • Create responses to literary texts • Generate the meaning of unfamiliar and multiple-meaning words by using context clues • Plan and conduct controlled scientific investigations, manipulating one variable at a time. • Design a solution or a product using a technological design process • Construct arguments that lead to conclusions about general mathematical properties and relationships. **Question Cues:** Design, synthesize, create, construct, com¬pose, invent, devise, plan, develop, produce, gen¬erate, imagine, formulate, envision, originate, revise, initiate, suggest, synthesize, visualize	**Activities, Quizzes, Projects** • Create projects that require articulation of a problem, the design, the data analysis, the results, and solutions as well as actually carrying it out **Classworks Sample Activities** • Understanding Context Clues, Grade 4, entire unit (Generate and formulate word meaning) • Introducing the Steps of the Writing Process, Grade 3, Think Sheet 1 (Descriptions) (Revise for clarity) • Acting it Out, Grade 2, entire unit (Construct and generate picture solutions) • Solving Problems by Drawing a Picture, Grade 3, entire unit (Visualize, suggest, and generate) • Exploring Drawing Conclusions, Grade 8, project, The Driver (Visualize, invent, and create character traits in a story) **Projects** • Exploring Multiple-Meaning Words, Grade 5, Bumper Stickers (Design and create bumper sticker using homographs) • Exploring Drawing Conclusions, Grade 8, The Driver (Visualize, invent, and create character traits in a story) • Introducing Sentences, Grade 1, An Invitation (Plan a party, and compose and design an invitation.) • Introducing Missing Factors, Grade 3, What is It? (Invent, create, and devise a scenario for finding missing factors.) • Using Bar Graphs, Grade 6, My Favorite Things (Create and formulate a bar graph showing favorite interests of community)

This document describes Classworks' rigorous and relevant instruction in support of Bloom's Revised Taxonomy. During the 1990's, Lorin Anderson (a former student of Benjamin Bloom) led a team of cognitive psychologists in revisiting Bloom's Taxonomy with the view to examining the relevance of the taxonomy as we enter the twenty-first century. This document is based on Anderson's work and was prepared in collaboration with Dr. Mildred H. Rowland, Ed.D. Dr. Rowland is a leader in the use of Bloom's Revised Taxonomy to integrate standards, objectives, assessments, activities and resources in South Carolina and across the Country, and has used Classworks in her school district as an instructional resource.

Classworks Independent Curriculum Review

California Learning Resources Network
Classworks review for K-10 English Language Arts, English Language Development and Mathematics

"Classworks is a computer-based instructional program aligned to the California Content Standards, STAR, and CAHSEE. It provides supplemental instruction and allows teachers and administrators to manage, assess, and customize student-learning experiences. The program uses many different instructional approaches to keep students engaged throughout the school year. It features the ability to read STAR test results and to automatically turn those results into individualized instruction for students."

Center for Data-Driven Reform in Education, Johns Hopkins University
Best Evidence Encyclopedia Review, Effective Programs in Elementary Mathematics: A Best-Evidence Synthesis, Robert E. Slavin and Cynthia Lake

The Best Evidence Encyclopedia is created by the Johns Hopkins University School of Education's Center for Data-Driven Reform in Education (CDDRE) under funding from the Institute of Education Sciences, U.S. Department of Education. It is intended to give educators and researchers fair and useful information about the strength of the evidence supporting a variety of programs available for students in grades K-12. The Best Evidence Encyclopedia (BEE) presents reliable, unbiased reviews of research-proven educational programs to help:

- *Policy makers use evidence to make informed choices*
- *Principals choose proven programs to meet state standards*
- *Teachers use the most powerful tools available*
- *Researchers find rigorous evaluations of educational programs*

Classworks was named a top-rated program based on strength of effectiveness, and received the highest review of all computer-assisted instruction programs in the study.

Educational Consulting Services
Classworks and Texas High School Mathematics Evaluation

"Classworks is the most comprehensive, well designed math software program on the market. It offers a vast array of engaging lessons, activities, projects, and assessments that are tightly aligned to the state curriculum. It is well structured and very organized, offering useful teacher tools such as reports, tracking mechanisms, and curriculum alignment formats that make teachers more efficient and ultimately more effective.

The student works through their own personal plan in an autonomous manner which allows for varying levels of teacher involvement. The exercises are extensive, varied and also allow students to practice their skills in multiple formats, which keeps them engaged. Every aspect of the Classworks program is highly motivating for students. Positive feedback, variability among activities and interactive presentation help keep students engaged. Many of the activities have a competitive angle that motivates students to want to learn the skill at hand. The activities are interactive and work at building the learners' confidence (a very important aspect to remediation)."

Next Generation Curriculum Services
Classworks review for Reading First – A Consumer's Guide to Evaluating a Core Reading Program Grades K-3: A Critical Elements Analysis

"The Classworks language arts program can be implemented, with confidence, for K-3 Language Arts instruction. Activities incorporate di-

rect and indirect instruction. Strategies include modeling, guided practice, synthesis, and application activities. Instruction draws upon prior knowledge and activities build upon mastery of prerequisite objectives. Classworks draws from a wide variety of texts and utilizes cross-curricular instruction."

Program in Education, Afterschool and Resiliency (PEAR) at Harvard University

Classworks review for the Consumers Guide to Afterschool Math and Literacy Resources published by the National Partnership for Quality Afterschool Learning at SEDL, a program funded by the U.S. Department of Education

The review focused on identifying high-quality curricula that would support the creation of intentional learning environments in effective afterschool programs. "The key to intentional learning is creating a precise match between clear learning goals and curricula specifically designed to meet those goals – met through Classworks' comprehensive state-aligned curriculum and ability to individualize instruction. Classworks strengths include the ability to target instruction based on standards, test results, or student needs as assessed by the teacher or program. Classworks provides instruction for foundational review, remediation, and intervention for struggling students."

Review of Educational Research

Peer-reviewed journal published on behalf of the American Educational Research Association (AERA)

The American Educational Research Association (AERA), founded in 1916 and based in Washington, D.C., aims to advance knowledge about education, to encourage scholarly inquiry related to education, and to promote the use of research to improve education and serve the public good. As the national interdisciplinary research society in education, AERA is dedicated to strengthening education research capacity by promoting research of the highest quality, undertaking education and training programs, and advancing sound research and science policy. AERA publishes six peer-reviewed journals and research and methodology books central to the field.

The Review of Educational Research (RER, quarterly, begun in 1931) publishes critical, integrative reviews of research literature bearing on education. Such reviews include conceptualizations, interpretations, and syntheses of literature and scholarly work in a field broadly relevant to education and educational research. RER published the Effective Programs in Mathematics study in the September, 2008 issue.

Dr. Mildred Rowland, Ed.D

Classworks review in teaching higher order thinking skills through Bloom's Revised Taxonomy

"Using Bloom's Revised Taxonomy shows us that knowledge is not a form of thinking; it is truly a result of thinking. And when learners are required to think in complex ways, they move beyond "information gathering" to making meaningful connections that extend beyond the classroom. Because Classworks encompasses each dimension of thinking, we see students who actively engage in scaffolding their learning and assume responsibility for constructing knowledge. As a vital teacher resource, Classworks provides both rigor and relevance to support student thinking that extends beyond traditional time-based boundaries. Classworks makes learning more authentic and meaningful"

Southern Regional Education Board (SREB) – Evalutech

Classworks review for K-12 English Language Arts and Mathematics

"This program presents information and activities in a concise and meaningful progression that allows for student success, teacher input, and accountability in performance. The teacher management component is used to monitor student progress and adapt the program to meet the needs of individual students. Classworks is a well-designed program that would be very helpful for streamlining student assessment and providing supplemental, remedial, or enrichment support for students. The combination of online and off-line activities promotes a well-balanced approach to delivering learning."

State of Rhode Island Education Adequacy Study

By R. C. Wood & Associates (Joint Committee to Establish a Permanent Education Foundation Aid Formula for Rhode Island)

The Evidenced Based methodology is built on the approach of what educational strategies and concepts appear to be most successful in improving achievement in the public elementary and secondary schools. The approach is essentially an identification of strategies in the research literature as to the organizational and delivery variables that improve student performance. Several recently released studies have had random assignment of groups and the random application of treatment to the groups and others have met specific "matching" research standards and can be seen as some of the strongest evidence yet as to effective programs and practices

Classworks was named an effective strategy in this study. "Classworks, from Curriculum Advantage, is a comprehensive computer learning system. It contains over 1,000 units of instruction, drawn from over 100 software titles. Classworks provides comprehensive curriculum materials, as well as the tools that let teachers and administrators manage, assess, and individualize their students' learning process."

Utah Instructional Materials Review – Utah State Office of Education

Classworks review for K-12 Language Arts, Reading Intervention, Mathematics and Special Education

"Classworks is an individualized program that can be used for intervention or remediation. The objectives are clearly stated with measurable outcomes. It is a very in-depth program with appropriate supplemental instruction. It utilizes current research-based practices. Classworks materials are age appropriate, of high interest and very engaging to the student. It accommodates for various developmental levels with appropriate font, illustrations, text features, etc., and provides high quality audio and visual effects that are appropriate as additional support for student learning. Content is organized so prerequisite skills and knowledge are developed before more complex skills."

2. Student Achievement

At the heart of every instructional decision is one key question: Will it help children learn? Tools and practices that are effective can be measured and results defined to show success. Educators rightly expect that a commitment of time and resources to a particular strategy will have a positive impact on their students.

Instructional technology is one such methodology with unlimited potential. "We know now - based on decades of use in schools, on findings of hundreds of research studies, and on the everyday experiences of educators, students, and their families, that, properly used, technology can enhance the achievement of all students," reports the US Department of Education in the Report, *The Costs and Effectiveness of Educational Technology.*

The key for educators and districts is finding the right technology tool – one that has an impact on the engagement, behavior, motivation and, most importantly, the academic achievement of their students.

Classworks has a proven track record of effectiveness as demonstrated through a number of studies. A US Department of Education Study, reviewing independent studies and analysis of dozens of instructional technology programs, finds that Classworks ranks at the top in evidence of effectiveness.

In addition, schools and districts using Classworks have shown that it makes a difference where it counts – in student achievement on state assessments and independent measures of learning and progress. Included are studies from across the country with a variety age groups and instructional settings. All have one thing in common – Classworks makes a difference.

Moore Street Elementary, Dublin City, GA

STUDENTS IN DUBLIN CITY, (GA) WITH EIPS TARGETED FOR INCREASED SCORES

Moore St. Elementary
CRCT Reading Scores

4th Grade: 78% (2007), 91% (2008)
5th Grade: 80% (2007), 89% (2008)

- 2007
- 2008
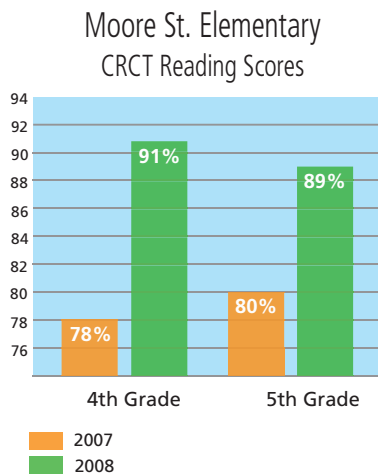
"Now that we have met AYP – we still can't be satisfied. Classworks has been great because the kids love it – and once you get the students engaged you have the battle won!"

— John Strickland, Principal
Moore St. Elementary School

Challenge: Moore St. Elementary had failed to make Adequate Yearly Progress for two years in a row; the last time in 2004-05. Their high free and reduced lunch population was similar to other schools in the district, yet they had not seen the same academic success. They determined to make sure the EIP students were getting the instruction they needed to be successful.

Goal:
- Use Classworks to provide intensive instruction to the students with educational improvement plans (EIPs)
- Increase reading scores on the Criterion-Referenced Competency Test (CRCT)
- Meet AYP for the first time in three years

Action Plan:
The plan included implementing Classworks in both classrooms and labs for 4th and 5th grade students with EIPs. In addition, Classworks was used for these same students for Tier II interventions through the RtI program, giving the students an additional 35 minutes per day with Classworks.

Results:
- Moore St. met AYP in 2008.
- Due to the improvement of the targeted students, they realized large reading gains.
- Fifth grade students increased from 80% to 89% proficient and fourth grade students jumped from 78% to 91% - in just one year.

Five Points Elementary, Dallas County, AL

FIVE POINTS ELEMENTARY (AL) SOARS EVEN HIGHER IN SECOND YEAR OF CLASSWORKS USE

Challenge: Five Points Elementary is 100% minority and has struggled to meet accountability requirements since the inception of NCLB. After a year of success using Classworks in 2006-07 and meeting AYP for the first time, they knew that their most challenged students were still struggling with math; something they had to address to break free from "Needs Improvement" status.
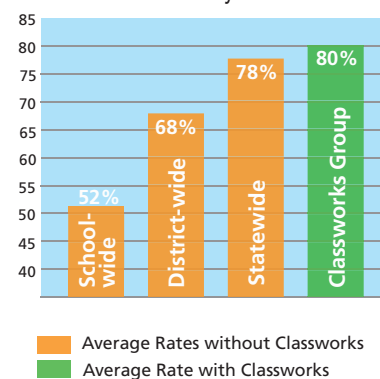
Goal:
- Meet AYP for the 2nd year in a row, taking them out of "Needs Improvement" status
- Bring proficiency levels up for the lowest performers, 3rd graders with Achievement Levels of I or II

Action Plan: Using Classworks to help their bubble students attain proficiency in 2006-07, Five Points met AYP for the first time. In 2007-08, they focused on the lowest performing students, those performing at Level I or II in math. The targeted group of students had a minimum of 30 minutes per day in the Classworks lab to work on skills identified through ARMT testing and automatically prescribed through Classworks.

Results:
- Five Points made AYP for the second year in a row, and is no longer in "Needs Improvement" status.
- Of the students selected for the third grade target group, 80% attained proficiency by performing at Achievement Level III or IV on the ARMT.
- This group of students, targeted due to previous poor performance, out-performed the school, district and state in math proficiency levels.

Proficiency Rates

School-wide: 52%
District-wide: 68%
Statewide: 78%
Classworks Group: 80%

■ Average Rates without Classworks
■ Average Rate with Classworks

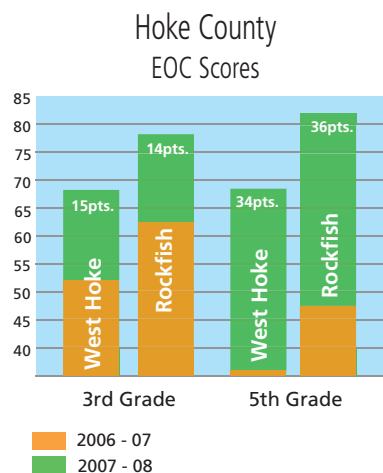"Classworks is a highly structured and exciting computer learning environment, making our most challenged students eager to learn. As they learn skills and see progress, they work hard to gain mastery and are rewarded by success. We have seen Classworks make a direct impact on performance at Five Points."

— Vickie Poe, School Improvement Specialist
Dallas County Schools

DISTRICT-WIDE IMPLEMENTATION HAS IMMEDIATE IMPACT ON MATH PERFORMANCE, HOKE CO. (NC)

Challenge: Hoke County implemented Classworks district-wide in January of 2007 to impact student achievement. With a high poverty level and a challenging population, they have traditionally struggled with performance. Elementary schools have embraced the district implementation as a way to help students struggling in math.

Goal:
- Provide intensive instruction to elementary students to improve scores on End-of-Grade tests
- Focus on math as area in most need of improvement

Action Plan: In the spring of 2007, Hoke County High School saw immediate gains after only a few months of intensive Classworks use. But the real success would be seen in 2008 by expanding those gains throughout the district, and sustaining the initial bounce with long-term increases in proficiency. In order to make a difference, students would have to have multiple opportunities to spend time engaged with Classworks instruction, including labs, whole-class instruction and extended day programs.

Results:
- Math gains were seen throughout the district and at all levels – elementary, middle and high schools.
- Elementary students saw dramatic improvement in end-of-grade tests, with gains as much as 35 points.

Hoke County
EOC Scores

3rd Grade   5th Grade

- 2006 - 07
- 2007 - 08

"Classworks is an Educational Partner with our District. From the beginning, we felt they really had the best interest of Hoke County Schools at heart. And when you look at the performance of our students throughout the district, you can see that it's working"

— Freddie Williamson, Superintendent
Hoke County School District

Windermere Elementary School, Orange County Public Schools, FL

ALL STUDENTS GROW WITH CLASSWORKS AT WINDERMERE ELEMENTARY
SCHOOL (FL)

Challenge: Windermere Elementary School is a high-performing school that consistently receives an "A" grade in Florida. For high achievers, consistently showing mastery is not enough. The challenge for Windermere was to ensure that all students are making positive learning gains.

Goal:
- Increase proficiency rates school-wide, including growth for high achievers
- Challenge lowest performers to make learning gains in line with the school average

Action Plan: Windermere integrated Classworks throughout the school in the 07-08 school year in both labs and classroom centers. With expectations set high, teachers used Classworks reporting to inform instruction and adjust assignments. The group targeted for intensive instruction included the lowest performers schoolwide.

Results:
- Proficiency rates school-wide increased from the previous year in both reading and math.
- Third graders, with the most time-on-task in Classworks, outperformed the district and the state with 88% of students performing level three or above, compared to 69% in Orange County and 72% state-wide.
- The targeted low performing group kept pace in learning gains with the rest of the school; showing growth for 72% compared to 71% school-wide.

Windermere Elementary
Proficiency Rates

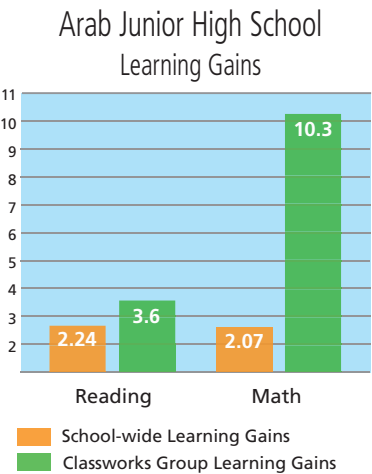|	Reading	Math
2007	87%	86%
2008	93%	90%
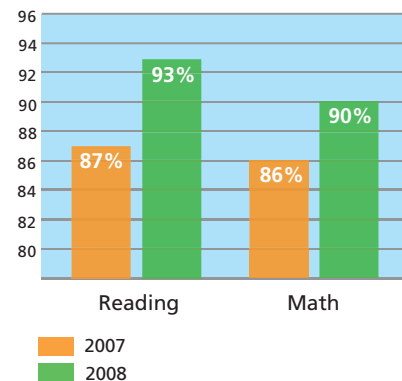
"What a very positive experience for students and teachers! The kids like it so much that sometimes you have to slow them down – they are so excited to learn with Classworks."

– Vicki Reed, Curriculum Coordinator
Windermere Elementary School

Arab Junior High School, Arab City Schools, AL

Arab Junior High School
Learning Gains

Bar chart showing Reading and Math learning gains:
- Reading: School-wide Learning Gains 2.24, Classworks Group Learning Gains 3.6
- Math: School-wide Learning Gains 2.07, Classworks Group Learning Gains 10.3

Legend:
- ■ School-wide Learning Gains
- ■ Classworks Group Learning Gains

"Our goal is to make sure all of our students continue to learn and grow, and that we pay special attention to those transition years. We strive to be the best and with our district at #3 in the state on ARMT, Classworks helped make it happen."

— John Mullins, Superintendent
Arab City Schools

CLASSWORKS EASES TRANSITION TO JUNIOR HIGH AND KEEPS TEST SCORES UP IN ARAB, AL

Challenge: Arab Junior High School has many positives, traditionally performing well on the ARMT and meeting AYP year after year. One trend that has caused concern though, is that as students leave elementary school to come to the junior high, their 6th graders typically see a drop in test scores from the previous year.

Goal:
- Use Classworks as intensive instruction to maintain the support for reading and math that students were used to in elementary school
- Reduce the drop in ARMT scores traditionally been seen in the 6th grade
- Maintain high performance levels school-wide

Action Plan: Provide intensive dedicated time for targeted 6th graders in danger of slipping during the transition to junior high, maintaining the focus on reading and math. This group used Classworks 5 times a week for fifty minutes each day, throughout the school year. Provide Classworks time for all students - grades 6-8 - with high expectations (80% mastery) and targeted instruction.

Results:
- Of the group targeted as most likely to see a decrease in test scores, with intensive Classworks use 86% maintained or increased their performance levels.
- In reading, the entire 6th grade increased their ARMT scores by an average of 2.24 points over the previous year. The Classworks group increased their reading scores by 3.6 points – a 61% greater gain.
- In math, the entire 6th grade increased their ARMT scores by an average of 2.07 points, while the Classworks group increased their math scores by 10.3 points. Almost 5 times greater gains!
- Arab Junior High School increased its standing on the ARMT to #3 in Alabama in grades 6-8.

Bell Street Middle School, Laurens 56 SD, SC

IAP STUDENTS EXCEED GROWTH TARGETS AT BELL STREET MIDDLE SCHOOL (SC)

Challenge: As Bell Street Middle School looked for ways to help struggling students, they targeted at-risk students with historically low performance and gave each an Individual Academic Plan (IAP). Math had particularly been an area where students have performed below expected levels, and after first seeing success with Classworks in summer school in 2007, they were ready to see how great the impact could be in a full year.

Goal:
- Provide sufficient engaged time for students with IAPs
- Improve target group test scores on MAP
- Use Classworks with MAP to predict PACT results
- Improve target group test scores on PACT

Action Plan: In their first year of implementing Classworks, Bell Street Middle School developed an intensive instructional program for their most challenged students - those with Individual Academic Plans. After identifying almost 100 students that had performed poorly on previous year's high stakes tests, these struggling students were given an intensive, structured Classworks implementation including daily lab instructional time focusing on targeted skills, use of imported MAP results to individualize instruction, and an innovative incentive program celebrating progress and personal milestones.

Results:
- The number of students in jeopardy of failing dropped by 60% to less than 40 students.
- There was a direct correlation between test scores and Classworks use, as 93% of the struggling target group with adequate engaged time in Classworks met or exceeded growth targets on the MAP assessment.
- PACT math scores improved among the target group and school-wide, with increases over their previous year's performance.

Bell Street Middle School
PACT Math Scores

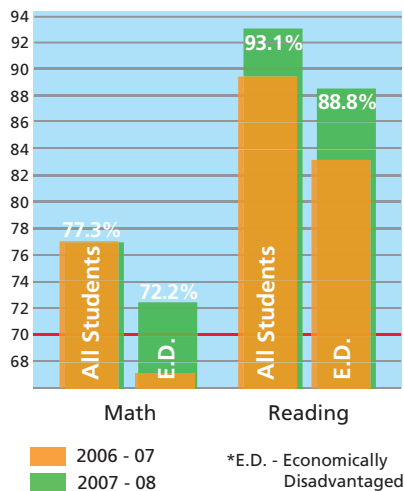|	7th Grade	8th Grade
2007	69.1	62
2008	74.8	66.3
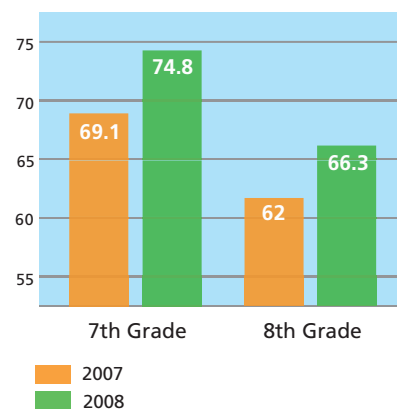
"The support from Curriculum Advantage has been tremendous – they want us to be successful. And as we see test scores improve and our struggling students make such great gains, we know it's working"

– Sara Adkins, Tech Specialist
Bell Street Middle School

Commerce Middle School, Commerce City Schools, GA

Commerce Middle School
CRCT Percent Proficient

Chart axis values: 94, 92, 90, 88, 86, 84, 82, 80, 78, 76, 74, 72, 70, 68

Math — All Students: 77.3%, E.D.: 72.2%
Reading — All Students: 93.1%, E.D.: 88.8%

Math   **Reading**

■ 2006 - 07
■ 2007 - 08

*E.D. - Economically Disadvantaged

"Classworks is a critical component of our Pyramid of Intervention process and our key instructional technology. Since putting it in place, we have seen improved performance from students at every level. The students with the greatest need have such a positive response to Classworks that it makes an immediate impact."

– Dr. James McCoy, Superintendent
Commerce City Schools

K-8 IMPLEMENTATION IN COMMERCE (GA) LEADS TO GAINS FROM PRIMARY TO MIDDLE SCHOOL!

Challenge: In their second year of Classworks implementation, Commerce City Schools were challenged to see gains made in Special Education in 2007 expand throughout the district. Based on the impact of Classworks in the primary school the previous year, Commerce wanted to replicate that success in the middle school.

Goal:
- Improve scores at the middle school so they could meet AYP for the first time in three years
- Improve scores for the Economically Disadvantaged students in the district and close the achievement gap
- See improvements in math, even with a more rigorous state test and increased state proficiency requirements

Action Plan:
Adapt the successful primary school program to suit the needs of the middle school with additional Classworks labs and whole class instruction. Target struggling students through Response to Intervention with Classworks, using close progress monitoring to ensure students are mastering concepts in Classworks – and see that mastery transfer to increased CRCT scores.

Results:
- Commerce Middle School made AYP for the first time in three years.
- The full student populations maintained or increased their scores over the previous year in both reading and math.
- The Economically Disadvantaged subgroups increased scores at an even greater rate in both subjects, and the achievement gap was tightened.

John Chavis Middle School, Gaston County, NC

INTENSIVE INTERVENTION FOR TARGETED STUDENT GROUP YIELDS RESULTS IN NORTH CAROLINA

Challenge: After failing to meet AYP in 2007, John Chavis Middle School wanted to focus on students that were struggling the most. Since Classworks was not implemented until midway through the school year, those students needed intensive instruction in order to impact their results immediately.
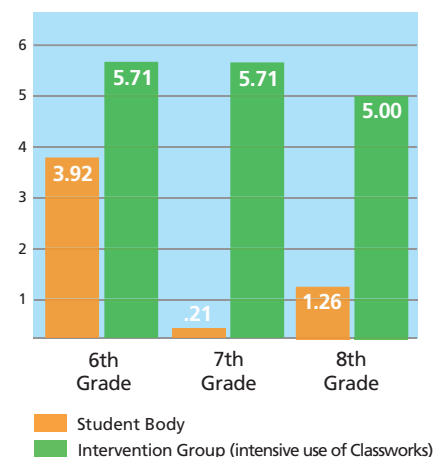
Goal:
- Target students who are most at-risk of not meeting proficiency on End of Grade (EOG) Tests
- Show demonstrable gains for Classworks students with intensive time-on-task

Action Plan: John Chavis identified those students most in need of intervention, and most at risk of failure. By focusing on these students they were able to maximize their time in the computer labs to meet instructional goals.

Results:
- When given adequate time on task in Classworks, the targeted intervention group made significantly greater growth on their EOGs than the school population as a whole.
- The target group outperformed the total student body in all three grades – 6th, 7th and 8th.
- The 7th graders had exponential growth, with an average of 5.71% gains compared to .21% for 7th graders overall.

John Chavis Middle School
EOG Growth

	6th Grade	7th Grade	8th Grade
Student Body	3.92	.21	1.26
Intervention Group (intensive use of Classworks)	5.71	5.71	5.00

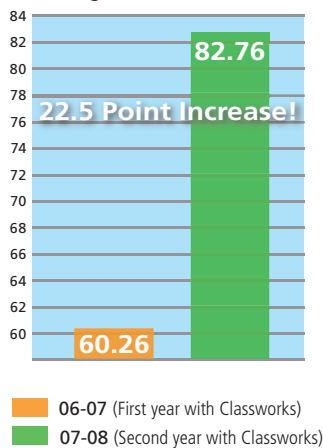■ Student Body
■ Intervention Group (intensive use of Classworks)

"Classworks was very beneficial for our kids. We were very careful about selecting students who could most benefit and it worked. The students in the program had greater growth than their mainstream counterparts – in most cases they had more than twice the growth."

– James Montgomery, Principal
John Chavis Middle School

East Gaston High School, Gaston County, NC

East Gaston High School
Algebra I EOC Test

82.76

22.5 Point Increase!

60.26

■ **06-07** (First year with Classworks)
■ **07-08** (Second year with Classworks)

Challenge: East Gaston High School has a number of students who struggle with the transition from middle to high school. Often their students fail to pass Algebra I or English I, putting them at risk of academic failure and dropping out.

Goal:
- Increase scores on the Algebra I End-of-Course (EOC) Test
- Use building block instruction to bring the lowest performers up to proficiency

Action Plan: Target Level 1 and 2 students who are at risk of or did not pass the Algebra I EOC test previously. Use an Academy approach to provide the target group with daily Classworks interventions for Algebra I, providing the skills required to pass the EOC.

Results:
- East Gaston High school increased Algebra I scores on the EOC for students identified as 'at-risk', from 60.26 to 82.76 percent proficient.
- The 'at-risk' group outpaced the school in Algebra I gains, with a 9.1% greater increase in proficiency than the school-wide population.

"As news spread about Classworks, everyone wanted to be involved. We have expanded access to many more Algebra I students throughout the year, not just those 'at-risk.' This year English I, Geometry and Algebra II students have the support of Classworks as well."

– Marty Starnes, Principal
East Gaston High School

Hoke County School District, NC

DISTRICT-WIDE IMPLEMENTATION YIELDS IMPRESSIVE GAINS IN HOKE COUNTY (NC)

Challenge: Hoke County implemented Classworks district-wide in January of 2007 to impact student achievement. With a high poverty level and a challenging population, they have traditionally struggled with performance. Seeing strong gains in 2007 after only three months of Classworks use, the high school was challenged to make even greater strides in 2008.
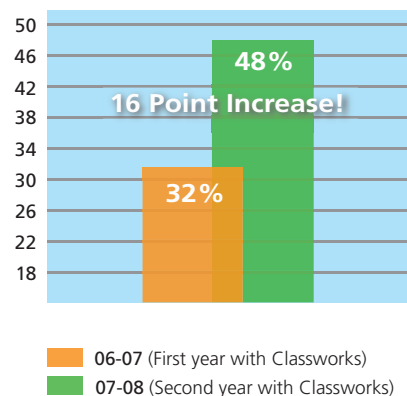
Goal:
- Address struggling students in the Freshman Academy through use of Classworks
- See gains on End-of-Course tests for the second year in a row

Action Plan: Hoke's Freshman Academy students were provided additional time to use Classworks both in the lab and in their math classes. With full support from district leadership, they have been able to integrate Classworks into their school day.

Results:
- Initial gains from 2007 were further improved in 2008.
- End-of-Course results improved 16 points for struggling students in Algebra I for the 2nd straight year.

Hoke County High School
Algebra I EOC Test

48%
16 Point Increase!
32%

50
46
42
38
34
30
26
22
18

■ **06-07** (First year with Classworks)
■ **07-08** (Second year with Classworks)

"We view Classworks as an Educational Partner with our District. From the initial communication about Classworks, we felt they really had the best interest of Hoke County schools at heart."

— Freddie Williamson
Superintendent, Hoke County SD

SUCCESS ON UTAH'S EXIT EXAM IS ACHIEVED WITH INTENSIVE INSTRUCTION IN CLASSWORKS

Horizonte Inst. Training Center
UBSCT Math Scores

Bar chart showing: Spring '07: 18%, Fall '07: 26%, Spring '08: 48%
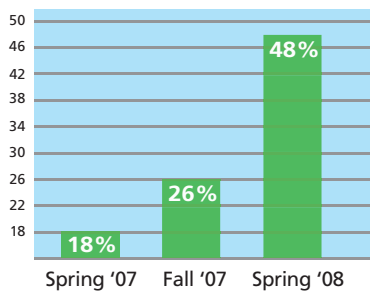
"The kids came out of the test very, very confident. They walked out with their heads up and smiles on their faces. Classworks gives them the confidence they need to perform well on the UBSCT."

— James Andersen
Principal
Horizonte Instruction and Training Center

Challenge: Horizonte Instruction and Training Center has been using Classworks since 2006 to help prepare their students for the high school exit exam, the Utah Basic Skills Competency Test (UBSCT). Horizonte has a typical urban high school population: its student body is 75% minority – the largest group being Hispanic – and has a 90% Free/Reduced Lunch population. As many of its students struggle academically and there is a high turnover among the student body, emphasis is placed on providing interventions in academic areas, and the faculty and staff are focused on making sure their students have every opportunity to succeed.

Goal:
- Maximize student time on Classworks in preparation for the UBSCT
- Correlate engaged time to exit exam success
- Improve UBSCT results, particularly in math

Action Plan: Horizonte uses data to drive instruction – using UBSCT results to identify and target instruction student by student. By ensuring every student is focused on the skills he/she needs to improve, no time is wasted and every moment in Classworks is meaningful.

Results:
- Direct correlation between engaged time in Classworks and UBSCT Success
- Multiple-year gains in UBSCT math scores
- An increase from a 26% pass rate in math in fall of 2007, to 48% in spring of 2008; 6 months later!

Northside High School, Houston County, GA

Challenge: Northside High School, like many high schools across the country, has been challenged to increase academic performance and reduce dropout rates in a culture where graduation is not necessarily the norm. Knowing that early success is the key to staying in school, they wanted to make sure they addressed their students' needs before they were on the wrong track.

Goal:
- Improve GHSGT scores among all demographics
- Improve pass percentages among first-time test-takers
- Increase graduation rate

Action Plan: With a new computer lab and using Classworks for only half a year starting in January 2008, Northside knew they would have to provide intensive instruction to 'at-risk' students for an immediate impact. Using the PSAT and End-of-Course tests to identify the students at risk of failing the Georgia High School Graduation Test (GHSGT), the targeted group was able to maximize their Classworks time in preparation for the GHSGT.

Results:
- Every targeted subgroup population, and the total student population, increased their GHSGT scores in both math and ELA from 2006 to 2007.
- Northside's 2008 graduation rate improved by 5% over 2007, and every subgroup outpaced state averages as well.
- Success in Classworks equated to high-performance - 97% of students with adequate time-on-task and performance levels in Classworks passed their GHSGT the first time.

Northside High School
GHSGT ELA Results

- 06-07 Scores
- 07-08 Scores
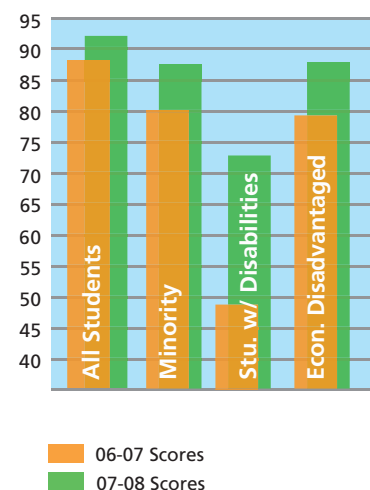
"You could see that our students were confident for the GHSGT this year. Since Classworks identified their strengths and weaknesses, they knew they were spending their time on the skills they needed most – and that helped them to be successful."

– Andrea Hodge, Lab Manager
Northside High School

Classworks
by CurriculumAdvantage

EFFECTIVE PROGRAMS IN ELEMENTARY MATHEMATICS: A BEST EVIDENCE SYNTHESIS

Robert E. Slavin
Cynthia Lake
Johns Hopkins University*

EDUCATOR'S SUMMARY

What mathematics programs have been proven to help elementary students to succeed? To find out, this review summarizes evidence on three types of programs designed to improve the mathematics achievement of students in grades K-6:

- Mathematics Curricula (MC), such as Everyday Mathematics, Saxon Math, and other standard and alternative textbooks.

- Computer assisted instruction (CAI), such as Jostens/Compass Learning and SuccessMaker.

- Instructional process programs (IP), such as cooperative learning, classroom management programs, and other approaches primarily intended to change teachers' instructional strategies rather than curriculum or textbooks.

* Full report available at www.cddre.org/resources/effprogsinmath.doc

Classworks
by Curriculum**Advantage**

www.classworks.com

(888) 841-4790

General Findings

Overall, 80 studies met the inclusion criterion, of which 36 used random assignment to treatments. These included 11 studies of mathematics curricula (1 randomized), 34 studies of CAI (15 randomized), and 35 studies of instructional process programs (20 randomized).

Mathematics Curricula (MC). The review found limited evidence that it matters which textbook is used, at least for student outcomes on standardized tests. Studies of curricula supported by the National Science Foundation, such as Everyday Mathematics and Math Trailblazers, found small differences in math achievement in comparison to control groups. Similarly, Saxon Math and traditional math texts had little evidence of effectiveness. Median effect size across 11 studies: +0.10.

Computer Assisted Instruction (CAI). Most studies of CAI find positive achievement outcomes. However, the outcomes are very mixed, and the highest-quality studies find few positive effects. Also, most qualifying studies evaluated programs that are no longer available; there are few studies of current versions of CAI. Median effect size across 34 studies: +0.19.

Instructional Process Strategies (IP). The highest-quality studies and strongest positive effects were found for instructional process programs such as cooperative learning, classroom management and motivation programs, and small-group tutoring programs. Median effect size across 35 studies: +0.33.

Program Ratings

Listed below are ratings of currently available programs. Within categories, programs are listed in alphabetical order.

Strong Evidence of Effectiveness
Classwide Peer Tutoring (IP)
Missouri Mathematics Program (IP)
Peer Assisted Learning Strategies (PALS) (IP)
Student Team Learning (IP)
TAI Math (IP/MC)

Moderate Evidence of Effectiveness
Classworks (CAI)
Cognitively Guided Instruction (IP)
Connecting Math Concepts (IP/MC)
Consistency Management – Cooperative Discipline (IP)
Project SEED (IP)
Small-Group Tutoring (IP)

Limited Evidence of Effectiveness
Accelerated Mathematics (CAI)
Dynamic Pedagogy (IP)
Everyday Mathematics (MC)
Knowing Mathematics (MC)
Houghton-Mifflin Mathematics (MC)
Lightspan (CAI)
Math Trailblazers (MC)
Project CHILD (IP/CAI)

Insufficient Evidence
Math Steps (MC)
Saxon Math (MC)
Scott Foresman-Addison Wesley Mathematics (MC)

No Qualifying Studies
Compass Learning (CAI) (Current version)
Corrective Math (MC)
Count, Notice, & Remember (IP)
Destination Math Series (CAI)
Harcourt Math (MC)

Investigations in Number, Data, and Space (MC)
Larson's Elementary Math
Math Advantage (MC)
MathAmigo (CAI)
Math Blasters (CAI)
Math Central (MC)
Math Coach (MC, IP)
Math Expressions (MC)
Math Explorations and Applications (MC)
Math in My World (MC)
Math Made Easy (CAI)
Math & Me Series (MC)
Math & Music (CAI)
Mathematics Plus (MC)
Mathematics Their Way (MC)
Mathletics (MC)
MathWings (IP/MC)
Macmillan McGraw-Hill Math (MC)
McGraw-Hill Mathematics (MC)
Number Power (MC)
Problem Solving Step by Step (IP,MC)
Progress in Mathematics (MC)
Project IMPACT (IP)
Rational Number Project (MC)
Real Math (MC)
Reciprocal Peer Tutoring (IP)
Singapore Math (MC)
SuccessMaker (CAI) (Current version)
Voyages (IP,MC)
Waterford Early Math (CAI)

Descriptions and Contacts of Programs with Evidence of Effectiveness*

Mathematics Curricula

[Limited] Everyday Mathematics—NSF-supported curriculum that emphasizes problem solving and concepts. www.wrightgroup.com or http://everydaymath.uchicago.edu/

[Limited] Houghton-Mifflin Mathematics—Standard math curriculum that has a focus on skill building, problem solving, and concept mastery. www.eduplace.com/math

[Limited] Knowing Mathematics—Remedial program for students performing below grade level. http://www.eduplace.com/profdev/knowing1

[Limited] Math Trailblazers—NSF-supported curriculum that emphasizes problem solving and concepts. www.mathtrailblazers.com.

Computer Assisted Instruction

[Moderate] Classworks—Supplementary integrated learning system.   www.curriculumadvantage.com

[Limited] Accelerated Math—Supplementary program that assesses students' learning and prints out assignments for students based on their level of performance. www.renlearn.com/mathrenaissance

[Limited] Lightspan/Plato Learning—Supplementary integrated learning system. Also provides CAI programs for home use. www.plato.com

Instructional Process Programs

[Strong] Classwide Peer Tutoring—Pair learning approach in which children take turns as teacher and learner. Contact Charles Greenwood at greenwood@ku.edu.

[Strong] Missouri Mathematics Program—

Program focusing on active teaching, classroom management, motivation. Contact Thomas Good, University of Arizona, at good@u.arizona.edu

[Strong] Peer Assisted Learning Strategies (PALS)—Structured pair learning strategy in which children take turns as teachers and learners. www.kc.vanderbilt.edu/pals

[Strong] Student Team Learning—Structured cooperative learning program in which students work in 4-member teams. Contact Nancy Madden, Johns Hopkins University, at nmadden@jhu.edu.

[Strong] TAI Math—Structured cooperative learning program in which students work on individualized materials in 4-member teams. Contact Brent Farmer, Charlesbridge Publishing, 800-225-3214, or bfarmer@charlesbridge.com.

[Moderate] Cognitively Guided Instruction—Program that provides teachers with workshops in math strategies. Contact Linda Levi, Teachers Development Group, at lindalevi@teachersdg.org

[Limited] Connecting Math Concepts—Structured approach to math with grouping by performance. www.sraonline.com/math

[Moderate] Consistency Management-Cooperative Discipline—Program that emphasizes classroom management, student engagement. Contact Jerome Freiberg, University of Houston, at cmcd@uh.edu.

[Moderate] Project SEED—Supplementary program that has mathematicians teach advanced topics in math to supplement regular instruction. www.projectseed.org

[Moderate] Small-Group Tutoring—Provides tutoring in small groups for struggling first-graders. Contact Lynn Fuchs, Vanderbilt University, at lynn.fuchs@vanderbilt.edu

[Limited] Dynamic Pedagogy—Program that provides teachers with workshops in math strategies. Contact Eleanor Armour-Thomas at armourthomas@yahoo.com

[Limited] Project CHILD—Program that uses cooperative learning, multi-age grouping, extensive computer-assisted instruction, and other features. www.ifsi.org/child.htm

*Evidence of Effectiveness
   [Strong]
   [Moderate]
   [Limited]

Review Methods

An exhaustive search considered hundreds of published and unpublished articles. It included those that met the following criteria:

- Schools or classrooms using each program had to be compared to randomly assigned or well-matched control groups
- Study duration had to be at least 12 weeks

- Outcome measures had to be assessments of the mathematics being taught in all classes. Almost all are standardized tests or state assessments.

• The review placed particular emphasis on studies in which schools, teachers, or students were assigned at random to experimental or control groups.

Programs were rated according to the overall strength of the evidence supporting their effects on math achievement. "Effect size" (ES) is the proportion of a standard deviation by which a treatment group
exceeds a control group. Large studies are those involving a total of at least 10 classes or 250 students. The categories are as follows:

Strong Evidence of Effectiveness: At least one large or two small randomized studies with median ES= +0.20 or more.

Moderate Evidence of Effectiveness: At least two large or four small studies (randomized and matched) with median
ES= +0.20 or more.

Limited Evidence of Effectiveness: At least one qualifying study with a significant positive effect and/or median ES=+0.10 or more.

Insufficient Evidence: Studies show no significant differences

N No Qualifying Studies: No studies met inclusion standards

Connections

For a related What Works Clearinghouse review of elementary textbooks, click on http://www.what-works.ed.gov/Topic.asp?tid=04&ReturnPage=default.asp.

For a related review by James Kulik on computer-assisted instruction programs in math and reading, click on
http://www.sri.com/policy/csted/reports/sandt/it/Kulik_ITinK-12_Main_Report.pdf

3. Effective Implementations

Based on extensive research, successful technology implementations are those that are embedded within a broad school improvement plan, specifically designed to meet the goals of a particular school or district. A well-planned, ongoing implementation is essential to having a significant and measurable impact on student achievement.

The use of technology in schools can produce dramatic results, when the right pieces are in place. The quality of the implementation is a key predictor of effectiveness to successfully integrate technology and bring about student academic improvement, reports the Panel on Educational Technology, 1997. Some of the critical pieces that ensure program effectiveness include:

- Effective leadership
- Quality professional development
- Fidelity of implementation
- Achievement goals that are incremental and sustained
- A commitment to integrate technology into the school day
- Research-proven instructional models as a foundation for school reform

"Through the use of technology, learning can be qualitatively different. We know that successful technology-rich schools generate impressive results for students, including improved achievement; higher test scores; improved student attitude, enthusiasm, and engagement; richer classroom content; and improved student retention and job placement rates," finds an Apple Inc., study, Classrooms of Tomorrow (ACOT).

In order to maximize the impact on student achievement, Classworks can be integrated into instructional models and implemented with success. The Classworks Implementation Process is focused on meeting the needs and requirements of each school or district. Included here are examples of some specific models that lay out a prescription for positive results with a fully integrated Classworks implementation.

Classworks – Implementation Options

- Standards-based Instruction and Mastery
- Individualized/Differentiated instruction and practice
- Whole Class Instruction
- Remediation in building block skills
- Intervention for Struggling Students - RTI
- Full Integration into Curriculum and Pacing Guides
- Special Education
- Self-Paced Learning
- Ninth-Grade Academy – Dropout Prevention
- In-School Suspension and Alternative Learning Environments
- Gifted and Talented – Extension and Enrichment
- Before and After School Programs
- Summer School
- Placement Tests and Benchmark Assessments
- Demonstration on both growth and proficiency
- Progress Monitoring
- Reporting and Accountability

Overview

The following evaluation of Classworks was undertaken to review the integration of Classworks in a Response to Intervention student instructional model. It includes an historical view of educational reform and the emergence of the Response to Intervention model. Classworks is described from a global perspective as well as a site-based examination of its use as an intervention solution.

Evaluator's Credentials

Dr. Cynthia C. Millikin, Ph.D. has served in the field of special education for over 30 years. She is currently the Assistant Director of Exceptional Student Services for a public school district in Colorado. Specializing in assistive technology, she has been a leader in the Response to Intervention process being implemented in her school system as well as school systems across the country. Dr. Millikin has published various books, contributed to the publication of a textbook, and has published in a peer-reviewed publication for the American Speech-Language-Hearing Association (ASHA). Dr. Millikin is currently serving as managing editor of the ASHA's Division 12 publication, Perspectives.

Introduction

Teaching children is increasingly a daunting challenge for educators. In addition to accountability for ensuring that all children learn state curriculum and are proficient at grade level expectations, there is a need to individualize instruction based on varying needs, provide differentiated instruction to reach all students, and motivate students to perform well on assessments. The key to learning is matching instruction to student need.

Instructional technology has the potential to help teachers do all this and more. With the right technology, all students can be engaged in relevant instruction, working independently on the skills they need, receiving constant feedback and progressing at their own pace. This frees the teacher to become a facilitator for all learning in the classroom, using data to make instructional decisions and time to focus attention where it can have the most impact.

An Historical Perspective

Gone are the days where the teacher closes her door with the first morning bell and provides for the education of the students in her classroom in isolation. Education has become increasingly guided and directed by legislation and what was once a teacher's responsibility has become a group effort. Two laws have had particularly significant impact on the education of students in this country, i.e., the Elementary and Secondary Education Act (ESEA) and the Education of All Handicapped Children Act (P.L. 94-142).

The ESEA was passed in 1965 as part of President Lyndon B. Johnson's War on Poverty and was closely followed by the famous Coleman Report of 1966. The ESEA authorized funds for professional development, instructional materials, resources to support educational programs, and efforts to promote parental involve-

ment. Through this legislation, Title I funds were made available to provide compensatory educational support for the poor; Title II funds provided library and other resources; and, Title III funds were provided to support innovative programs. ESEA funds also provided program support for the origination of what is today HeadStart, and supported other programs for bilingual education. When ESEA was passed in 1965, it was intended for the Act to remain in effect until 1970; however, it has continued to be reauthorized every 5 years since its original enactment and is currently known as the No Child Left Behind Act.

The historical legislation that has provided for educational entitlement rights to children with disabilities was commonly referred to as Public Law 94-142, the Education of All Handicapped Children Act (EHA), when it was first enacted in 1975. This law provided strict guidelines and protections for the education of students with disabilities, including zero reject, nondiscriminatory classification, the requirement of individualized educational plans to be conducted in the least restrictive placements, and a mechanism of procedural safeguards and system for participatory democracy so parents and students have vehicles to participate as part of the IEP team. As with ESEA, P.L. 94-142 has undergone continual reauthorizations since its first enactment. In 1990, the reauthorization of the law included a change in name to the Individuals with Disabilities Education Act (IDEA), using "people first" language when referring to students with disabilities.

In 1983, the National Commission on Excellence in Education wrote a blistering report on the state of education in this country. The report charged that "our society and its educational institutions seem to have lost sight of the basic purposes of schooling, and of

the high expectations and disciplined effort needed to attain them" (http://www.ed.gov/pubs/NatAtRisk/risk.html). The statistics they offered as indicators were alarming. They noted that 23 million American adults were functionally illiterate, with functional illiteracy among minority children potentially running as high as 40%. The Commission noted the impact of inadequate education on businesses and the military, reporting that business and military leaders had complained of the efforts and expense required in order to provide remediation to recent hires. The Navy reported to the Commission that "one-quarter of its recent recruits cannot read at the ninth grade level, the minimum needed simply to understand written safety instruction." (http://www.ed.gov/pubs/NatAtRisk/risk.html). America's educational system became a focus for reform.

In 2001, President Bush signed the most recent reauthorization of the No Child Left Behind Act. The term diverse learner has become the global terminology that is now being used to refer to children in classrooms who have unique learning needs. They may be students who have limited ability with the English language, children who are gifted and talented, or students with disabilities. Regardless of the differences, NCLB makes it clear that the goal is for EVERY child to make adequate yearly progress in school. Along with the focus to ensure progress for every child, NCLB legislates standards for high quality teachers, requires public accountability of results, emphasizes research-based teaching methods or evidence-based practice, and encourages flexibility and choices for parents of children who are disadvantaged.

In 2004, the reauthorization of the Individuals with Disabilities Education Act was

passed which basically aligned the tenets of IDEA with NCLB. As an added point of emphasis, the title of the Act was changed to the Individuals with Disabilities Education Improvement Act (IDEIA), thus emphasizing the goal of improving student education and achievement. IDEIA provides specific guidelines for the instruction of students with disabilities and defines specially designed instruction as "adapting, as appropriate to the needs of an eligible child under this part, the content, methodology, or delivery of instruction – (i) to address the unique needs of the child that result from the child's disability; and, (ii) to ensure access of the child to the general curriculum, so that he or she can meet the educational standards within the jurisdiction of the public agency that apply to all children". IDEA 2004 also introduced a new term and concept to this country's educational reform, Response to Intervention.

Response to Intervention

In the context of IDEA 2004, Response to Intervention (RtI) provides an alternative process for identifying students with Specific Learning Disabilities rather than the traditional "wait to fail" discrepancy model. Under the traditional model, a discrepancy between a student's cognitive ability and achievement was required before a student could be identified as having a specific learning disability (SLD). By the time the diagnosis of SLD was applied, a student was significantly behind his/her peers. The core principles of RtI do not support this traditional process but instead directs a proactive approach to a student's needs. Student achievement is monitored for all students through a universal screening process and interventions

are applied as soon as a student begins to fall behind the rest of his/her peers. The determination of a learning disability is made after monitoring a student's initial response to instruction and then further responses to interventions. Interventions are applied within a multi-tiered model of service delivery.

In its broader sense, RtI represents the culmination of the educational reforms that have been converging on our schools over the past several decades. It drives a new partnership between all the players in our educational system and guides the pyramid of interventions that begins as soon as a student begins to fall behind his/her peers in the classroom. Key components to RtI include: a multi-tiered model of service delivery, an integrated data system for progress monitoring, a problem-solving process for the determination of students' needs, and research-based interventions.

Tiers of Interventions

Teachers use a teaching-learning cycle to deliver instruction, which involves an iterative process of teaching, monitoring, adjusting the instruction, and re-assessing the learning. RtI takes the teaching-learning cycle and applies a similar type of monitoring process at all levels, from the individual student, to the class, to the grade level, to the school, and to the district as a whole. It offers a consistent process by which a school district can monitor their students' response to instruction and to the curriculum.

Most states have adopted a 3-tier model or a 4-tier model of service delivery, depicted as a pyramid of interventions. The tiers represent a progression of inter-

ventions from standard, classroom-based teaching and learning to targeted instruction with interventions to the uppermost tier in the process where intensive interventions and specialized instruction occur. At Tier 1, the focus is "good first instruction first". What is meant by this expression is that we need to first ensure that the initial instruction is sound and delivered with fidelity, employing best practices in instruction. At this first level, the goal is for 80% of the classroom to demonstrate learning of the state's standards at grade level. As RtI gets underway in many school districts across the country, the initial emphasis and foci is to shore up instructional practices in order to reach this response rate of 80% with basic classroom instruction. If 80% of a classroom is not on grade-level standards, the initial focus for the district is to seek instructional supports and additional learning options to improve the overall learning rate and response of the general classroom. Key to this first tier of intervention is a process for universal screening where students' responses to instruction can be monitored.

For students who do not respond as expected to the initial instruction as compared to 80% of their peers, Tier II offers a mechanism for additional targeted interventions and further progress monitoring. Tier II is focused on accelerating student growth and learning. Using a problem-solving process based on the student's response to instruction in Tier I, skill areas that are not accomplished become the focus for intervention. Tier II represents an estimated 10-15% of the school population. The distinction between tiers is the level of intensity applied to the intervention efforts.

Tier III represents the near tip of the pyramid, representing approximately 5% of the student population who will require inten-

sive interventions for learning. In states that have adopted four tier levels, the final tier level includes those students receiving intensive specialized instruction through special education at its most rigorous level of support. Students with disabilities exist across all levels of the tier system. As noted earlier, it is the intensity of the targeted interventions that determines the tier level. As the students' instructional support moves up the pyramid, the intensity and individualization of the instruction increases while the size of the instructional groups to which the student is assigned typically decreases.

Learning in the Classrooms of 2008

With this advent of RtI, instruction is becoming increasingly individualized, with the tenets of differentiated instruction and universal design for learning becoming commonplace. As noted in the introduction, gone are the days of teaching to the middle and ignoring the students who are the outliers. With the requirement of Annual Yearly Progress (AYP) for ALL students, teachers must remain focused on the progress and learning rates of all their students. When students do not respond as expected to the initial instruction, interventions need to be implemented to accelerate student learning. How is this accomplished within the current resources of a classroom?

Classrooms have become bustling learning communities, with students increasingly assuming greater responsibility for their own learning. Teachers have become the facilitators and managers for student learning. They seek tools that offer individualized, self-paced learning. They structure their classroom activities with centers for learning. When one walks into a classroom today, active engagement in the learning

process is observed. Students may be working independently at their desks, working on computers with headphones, conferring with their teacher, or working in small groups. There may be several educators in the room, including the general educator, a special educator, or related services personnel from special education (e.g., speech/language pathologist), working together to develop standards-based concepts and skills. It is clear that the classrooms of today are learning communities.

Classworks

As school systems across the country adopt their Response to Intervention plans for targeted student interventions, many are seeking tools that will provide focused instruction in specific skill areas. Companies that have dedicated their efforts to the support of education and student achievement are putting their programming talents toward the development of skill-based tools to support student learning. Curriculum Advantage, Inc. offers years of talent and educational experience to school districts and has developed a flexible, standards-based program that provides unique support options to teachers through their instructional software, Classworks.

Classworks is an integrated, software-based curricular program in the areas of English/Language Arts, Reading, Math, and Science that is aligned with state standards. Classworks integrates the use of 180 award-winning software programs in its presentation of learning materials to students. Students may interact on a skill using a game format in one context and another approach the next time. The pro-gram uses the latest in technology and provides a colorful, quick-paced approach for learning. Student engagement in the learning activities remains high.

Through its alignment with state standards and the import function of students' performance data on state testing, Classworks offers targeted and individualized interventions for students. When Curriculum Advantage, Inc. opens a new market area of the country for Classworks, they first conduct a great deal of in-depth research and analyses of the software to that state's standards and the state testing results. Item analyses are conducted between the lesson activities in Classworks and state assessments. When student performance indicators are entered into its management system, Classworks identifies the targeted skills areas that are needed by that student. When a student logs into the system, the program is individualized to present those tasks and activities that are needed to improve that student's performance and achievement on the state's high stakes tests.

In its instructional design, Classworks employs the teaching/learning cycle to present new learning to students. Each skill area begins with a mini-lesson where a specific skill or concept is introduced. The student then engages in a variety of learning activities to demonstrate mastery of the skill. At the end of each mini-lesson, the student responds to a probe, or quick quiz, to evaluate mastery. If the student does not achieve mastery, a remediation phase is introduced that presents the learning concepts through another set of activities and skill-practice.

Classworks also includes a rich set of projects that provides real-life application of

the learning. Small groups of students can work together to demonstrate synthesis of the skills through these projects and produce integrated products that incorporate the learning of the units that have been studied.

A Pyramid of Interventions for Students

Classworks is a tool that can be used at each tier for student learning. At Tier One, Classworks is a curricular tool for instruction – in math, reading, language arts, and science. The research-based instruction is differentiated to address learning for all students. It provides a multisensory presentation of concepts for good, standards-based first instruction. Students are immersed in the concepts and engaged in a variety of activities that move the student from the introduction of the anticipatory set, through guided practice, then into the demonstration of learning in independent practice, followed by a synthesis of the learning in the creation of projects.

At Tier Two, Classworks creates customized learning paths for students that are individualized, based on the students' response to statewide testing and/or benchmark assessments. Students are engaged in activities that have shown a direct correlation to the specific learning in the state's standards and assessments. Skill practice is focused and designed to be in direct response to the students' demonstrated needs, and academic progress can be monitored by teachers or the academic support team.

The customization and individualization continues with Classworks at Tier III and Tier IV. In addition to the import of the individual student's performance data, the teacher has the ability to create customized design

sets for the students, based on his/her knowledge of student needs and professional opinion on the skill areas that need continued focus and practice. Instructional decisions are informed by reports designed to indicate both mastery and progress. These lessons can be directly aligned to the students' IEPs.

The engaging nature of Classworks instruction, along with interactivity, feedback and varying instructional modalities, provides high interest for all students, while specifically having a positive impact on students at the higher tiers, affecting the behavioral aspect of the model as well.

Buford Middle School, Buford, Georgia

Buford Middle School is located in the ever-expanding greater Atlanta metro area with a mix of small-town, suburban and urban populations. This diversity is met at the middle school by a staff committed to helping every child succeed. With a goal of ensuring that students explore new areas of learning to help develop interests, identify talents, and sharpen skills, students are challenged to excel in all aspects of their learning process.

When Buford Middle School was looking for a school-wide solution to support student learning, they reviewed a variety of computer-based tools. Ms. Rachel Adams, Principal, describes the resources of her school. Each grade level has a computer lab, with an average of 1 ½ computers per student. They decided on Classworks for a variety of reasons, including its alignment to state standards, its ability to focus on students' actual performance on the Georgia high-stakes test - the Criterion-Referenced Competency Tests (CRCTs), the fact that they will no longer have to worry about their soft-

ware remaining up-to-date with graphics and technology because Classworks is continually upgraded and, finally, the services and support provided by Curriculum Advantage, Inc.. Ms. Adams describes her relationship to the company representatives and their personal involvement with her and her school, "I see them. I talk to them. They are consistently checking on us. They know me by name. They know me by sight. The service has been critical."

Buford Middle School has incorporated the use of Classworks across all tiers for RtI. They have imported the students' data from the CRCT and structured the program to provide remedial support to the students based on each student's response to the state testing. At Tier I, Buford Middle School has each student work with Classworks three times a week for 45 minutes. They review the progress monitoring tools within Classworks at the end of each week to determine which students are responding to the instruction and which students may need further reinforcement.

At the Tier II level, students work with Classworks 4-5 times per week, with progress monitoring conducted twice a week. Buford Middle uses the reporting features of Classworks to monitor the student's progress with this more intense engagement with the learning materials.

Finally, at Tiers III and IV, teachers are able to prescribe the specific learning and programs they wish the students to perform. Progress monitoring is conducted through the program. The Classworks interaction, combined with the targeted and specialized instruction by the special educator creates a winning combination for student learning.

Conclusion

For the last 30 years, our country has expended its efforts in establishing a system for learning that will ensure our children are competitive in the world market. The increased accountability and the collaboration of all groups in designing instructional systems will ensure adequate yearly progress for all students and serve to eliminate or reduce the high levels of illiteracy. As our efforts have gathered momentum, the field of technology has also continued to expand and improve. With the creativity inherent in digital technology, combined with the capability of today's computers, teachers now have powerful tools to employ while creating a community of learning in their classrooms. Classworks has taken the power of technology and combined its focus on state level standards to create a tool that spans the pyramid for instruction and interventions.

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Matching Instruction to Student Need

Tier IV		Key Elements	Classworks
Who –	Individual students with an Individual Academic Plan (1-5%)	Screening/Assessment	Quick Quiz results by individual unit and skil
What –	Intensive individualized instruction through the Special Education program	Instruction	Highly intensive, individualized instruction based on individual academic plans
When –	Most of the academic day	Implementation	Special education program in regular or special education classroom
Where –	Regular or special education classroom	Progress Monitoring	Special education teacher using Classworks Student Report Card

Tier III		Key Elements	Classworks
Who –	Individual students with sustained needs (5-10%)	Screening/Assessment	CBA by skill in short, frequent tests
What –	Individualized interventions with differentiated instruction	Instruction	Fully individualized instruction customized by student need
When –	Additional engaged time may replace other subjects	Implementation	Extended opportunities for practice in before-school, after-school, lunch-break, or special RtI periods
Where –	May be within or outside of the regular classroom	Progress Monitoring	Academic support team using CBA Student Progress Report

Tier II		Key Elements	Classworks
Who –	Small Groups of students who need additional help or remediation (15-20%)	Screening/Assessment	State High-Stakes import or CBA by strand to indicate academic focus areas
What –	Supplemental instruction with focus on particular skills	Instruction	Targeted instruction with multiple learning approaches based on skills and strands that are failed most often
When –	Additional engaged time before/after school, pullout classes	Implementation	Extra opportunities for supplemental instruction provided to small groups in classroom or lab
Where –	May be within or outside of the regular classroom	Progress Monitoring	Classroom teacher and academic support team using Classworks RtI Report

Tier I		Key Elements	Classworks
Who –	All students (80-90%)	Screening/Assessment	District, state or CBA assessments determine students in need of additional academic intervention
What –	Standards-based differentiated instruction using research-based strategies	Instruction	Differentiated, research-based instruction aligned to state standards, providing for on grade level, remediation or enrichment
When –	Integrated instruction within regular school day	Implementation	Whole class instruction and regularly scheduled lab time
Where –	Regular classroom setting	Progress Monitoring	Classroom teacher using Classworks Success by Strand Report

INTRODUCTION

The Florida Continuous Improvement Model (FCIM) is a program for school reform and improvement, based on Total Quality Management principles, Effective Schools research, and the Eight Step Instructional Process. This article will describe the Florida Continuous Improvement Model and describe how Classworks, by Curriculum Advantage, Inc., can be an extremely powerful tool as part of this model.

FLORIDA CONTINUOUS IMPROVEMENT MODEL

Florida's Continuous Improvement Model (FCIM) is an ongoing process in which data analysis drives classroom instruction in areas of needed improvement. High student achievement based on the Sunshine State Standards is the instructional goal of the FCIM.

Implemented at all levels, the FCIM assesses student learning to improve student achievement. Based on the resulting data, students who have achieved mastery receive enrichment to challenge them further. Others receive tutorials or remediation to bring their skills up to accepted standards.

Components of FCIM:

- Data Disaggregation
- Instructional Focus Calendar
- Instructional Focus Lessons
- Mini-Assessments
- Tutorials, Enrichment and Maintenance
- Monitoring

CLASSWORKS

Classworks offers computer-based instruction aligned to Florida Sunshine State Standards that is ideally suited to help schools integrate instructional technology with the Florida Continuous Improvement Model. Classworks' rigorous content is effective in starting students with building block skills and guiding them through the learning process to more complex understanding of concepts, with a consistent goal of having students succeed with 'on grade-level' curriculum and beyond.

Classworks' unique features include:
- Rigorous, Relevant Content:
  - Award-winning software titles from leading publishers aligned to Sunshine State Standards and the FCAT
  - 11,000 engaging activities making up 2,404 instructional units
  - 1,650 skills and concepts organized by grade, subject and state standards
  - 5,000 hours of interactive, standards-based, managed activities
  - 6,054 valid and reliable items in the Benchmarking Assessment
  - Expanded academic opportunities in the form of cross-curricular projects
- A management system that assesses, diagnoses, prescribes and implements the best individualized educational plan for each student.
- The ability to read and import student results from the FCAT and automatically prescribe an individual student learning path for each student.
- Reporting and progress monitoring enabling teachers and administrators to manage student instruction and monitor progress at the site or district level.

Classworks is organized into skill-based in-

MINI LESSON
This anticipatory set is designed to introduce a specific concept and provide skills instruction.

INSTRUCTIONAL ACTIVITIES
11,000 activities, 2,500 instructional units and more than 5,000 hours of interactive programming are used to create differentiated, standards-based instruction. Students truly encounter a subject from varied perspectives and learning styles.

REMEDIATION
If a student does not pass the quiz, Classworks automatically generates a set of activities that approach the objective from a new perspective.

QUICK QUIZ
A 10-question quiz determines each student's achievement with the specific skill. Those who master the quiz move on to Project activities.

PROJECTS
Extension activities provide students the opportunity to demonstrate mastery through real-world application of knowledge and critical thinking related to the skills learned.

structional units that provide depth and breadth for every concept, ensuring mastery and increased student achievement. The engaging activities with multiple instructional approaches provide differentiated instruction - motivating students by providing fresh ways to learn a skill or concept.

Within the framework of the FCIM, Classworks units address each component.

CLASSWORKS AND THE FCIM PROCESS

DATA DISAGGREGATION
Determine academic strengths and weaknesses

Classworks assessments, used in conjunction with state required assessments, can help school districts gather the data needed to make immediate and effective educational decisions that will ensure student academic progress. Classworks assessment tools allow teachers to screen students for academic strengths and weaknesses, diagnose appropriate learning paths, prescribe the appropriate course of study based on standards, and monitor student progress.

Classworks assists in the early identification of learning deficits through assessments and reports, giving educators the data required to apply needed intervention to individual students. Complete and accurate documentation on assessment results, content mastery and time-on-task allows schools to evaluate data and make informed instructional decisions.

Students benefit from the use of complete and accurate documentation that allows schools to implement the most effective course of study.

INSTRUCTIONAL FOCUS CALENDAR
Develop a timeline to address identified academic weaknesses

Classworks is a technology-based curriculum that covers student learning from kindergarten through the high school exit exam. Content is aligned to Florida Sunshine State Standards to ensure coverage of identified necessary topics, skills, and scope of knowledge. The instruction can be customized to match the district or school curriculum map, pacing guides, and instructional calendar.

Classworks is a flexible system that can be organized as a spiraling or laddered curriculum to meet a variety of curriculum needs. This flexibility gives teachers the ability to organize, assign, and adjust instruction easily to provide relevant, targeted instruction at the appropriate time.

INSTRUCTIONAL FOCUS LESSONS
Provide explicit instruction of the identified benchmark skills

Classworks curriculum and content is aligned to Florida Sunshine State Standards and the FCAT to ensure focused instruction that meets the needs of students, allowing for the greatest opportunity for mastery of standards, high performance on the FCAT, and academic success. Classworks includes comprehensive curriculum materials, as well as a set of tools that lets teachers and administrators manage, assess, and customize their students' learning process.

Classworks instruction is organized in a way

that maximizes the opportunity for students to learn the instructional focus in the classroom. Mini-lessons are designed to provide an anticipatory set or a tutorial, a way to teach the designated objective. They provide three instructionally effective elements to the unit – learn, apply and review. The 'learn' section has the initial delivery of instruction, including all content required to learn the concept. The application section of the lesson is for practice where consistent feedback is given. The third piece of the mini lesson is the review, including all key concepts that will be assessed. Teachers can use Classworks mini-lessons to present each new skill to the class as a whole using 21st Century Classroom technologies. The instructional team can also quickly and easily assign students independent lessons reinforcing the instructional focus.

Each unit contains activities with different approaches to the same concept, having substantial student interest and appeal. Students experience only the highest quality of differentiated instruction while progressing; reinforcing the instructional focus of the classroom.

MINI-ASSESSMENTS
Conduct Mini-Assessments to ensure mastery of benchmarks

Classworks offers many opportunities to assess student progress and mastery.

The Quick Quiz provides frequent, skill-based tracking of student performance through quiz results at the end of each Classworks unit. The quiz measures the student's proficiency in the skill learned in the unit. Students scoring less than the mini-mum score on the Quick Quiz are automatically branched to the remediation activities for more instruction and practice. After remediation is complete, students have another opportunity to show mastery.

The Classworks Benchmarking Assessment (CBA) is a seamless diagnostic/prescriptive tool tying assessment to instruction. CBA measures student mastery of benchmark skills, and automatically creates a learning path for each student based on the results. Students can be assessed for mastery either by discrete skill or broader instructional concepts. Assessing one skill at a time is an opportunity to use the results to guide instruction quickly, easily and often.

Classworks also reads student results from high-stakes tests and automatically prescribes individualized learning paths based on student needs. These prescribed learning paths become part of the Individual Success Plan for each student, helping individual students improve in areas of weakness made apparent by low scores on the assessment. Results from assessments – formative assessments, benchmark tests and high-stakes tests – can also be used to inform instruction, and assign targeted instruction for the next critical steps in the learning path.

TUTORIALS, ENRICHMENT AND MAINTENANCE
Provide tutorials, enrichment and maintenance for all students as well as planned spiral reviews.

The Classworks prescription drills down to the most granular instructional level. Engaging activities motivate students to develop their skills while allowing them to advance at their own pace, and individualized in-

struction ensures that each student's needs are met by providing appropriate practice, reinforcement and remediation as the student progresses through skills.

Classworks provides differentiated student experiences for tutorial, enrichment and maintenance instruction:

- **Tutorial** – Basic instruction is provided through the mini-lesson. This is offered in a "learn, apply, review" format that gives the student opportunities to return to the lesson for reteaching and additional practice. Each instructional unit has activities that are specifically designed for remediation, additional practice, and new approaches for a fresh way to learn the concept.

- **Enrichment** – This instruction is provided through accelerated grade level content and Classworks Projects. These projects are standards-based projects requiring students to think in complex ways while applying their learning to real world situations. This provides enrichment for high achieving students while still working within the area of instructional focus.

- **Maintenance** – The tutorials are paired in the unit with activities that are part of the spiraling curriculum, with opportunities to review concepts without losing the impact of the engaging content. By always offering multiple learning opportunities, students can continue to work on standards-based skills to reinforce concept mastery.

MONITORING
Monitor progress to evaluate program success

Classworks provides the tools for close and constant progress monitoring. As students progress through the instruction, detailed information about their performance on each activity is measured and reported upon. District-level reporting also provides the opportunity to assess progress among school sites, district-wide, or targeted student populations including demographics, grade levels, and classes.

- Teachers can access student results from their classroom
- Principals and other designated site administrators can access results from all students in the school
- District-level administrators can track all Classworks implementations across all schools, from the district office

CONCLUSION

Working with the Classworks solution, educators are able to access the resources that they need to assess, diagnose, prescribe, and implement the best educational plan for each individual student. Continuous tracking of student progress, combined with the ability to re-assess student needs and re-evaluate prescribed learning paths, gives Classworks users the flexibility required to address students' academic challenges. In addition, the management system provides documentation for data driven decisions. This solution provides the tools for all students to succeed through the Florida Continuous Improvement Model.

This document describing Classworks' integration into the Florida Continuous Improvement Model is based on the Florida Department of Education's work in FCIM and the successful model implemented by Dr. Gerald Anderson.

Despite the increasing importance of education in the labor market and on the world stage, 1.23 million students will fail to graduate from high school this year.

Nationwide, only about 70 percent of 9th graders make it to graduation four years later. And that figure drops to 46 percent for black males and 52 percent for Hispanic males. An indicator of a critical point to reach students is exemplified by the fact that more than one-third of the students who drop out do so during the transition from 9th to 10th grade.

Twenty years ago the report A Nation at Risk called for more academic courses taken by high school students. In response, most states upgraded their graduation requirements to more closely match those recommendations. Despite this change, national data indicates that academic achievement in high school reading and math has remained stagnant for decades.

> "Many of life's failures are people who did not realize how close they were to success when they gave up."
>
> ~Thomas Edison

NCLB and High School Graduation

In recent years, the question of how states and districts calculate their dropout rates and graduation rates has become a greater concern, not only because states must include graduation rates as a measure of high school performance under the No Child Left Behind Act (NCLB), but because the American economy is increasingly dependent upon a workforce that has, at a minimum, completed high school.

In addition, increased scrutiny has made it clear that self-reported dropout rates and graduation rates by states and districts are highly inaccurate, due to variations in calculation methodologies and inadequate reporting mechanisms. Secretary of Education Margaret Spellings is attempting to overcome the state by state discrepancies by defining a single federal graduation rate and requesting all states to report it that way. This will no doubt shine an unflattering light on high school issues in many areas of the country.

Classworks – Preparing All Students for Success

High dropout rates are a common problem requiring an uncommon solution. Because of the very special challenges facing adolescents during this transition period, Curriculum Advantage, Inc. has taken a specific look at the most effective ways to address the needs of middle and high school students. Based on best practices in reaching these students and in using research-based instructional technology, we have developed an instructional model designed to identify struggling students early and help those students see success and reach graduation.

With a goal of prevention rather than recovery, Classworks' comprehensive instructional model identifies and prescribes a plan to engage and support students, prevent failure, reduce dropout rates, and increase achievement levels for middle and high school students.

KEY

🏫	All Students
🎯	Intervention Students
☑️	Check Point
🔍	Teacher Intervention
🏅	Celebrate Success!

Middle School

In the Classworks Model, the intervention group of students are provided accelerated curriculum as a way to move them to grade level proficiency prior to entering high school. This model works in both traditional and accelerated middle schools.

Grade 6

Beginning of school year – all students on 6th grade state curriculum standards-based instruction; reinforcing classroom instruction and pacing guides.

At the end of the first quarter, school grades and EOG test history are reviewed to determine intervention group.

State Curriculum Skill Building - Acceleration
Once this group is identified, they branch into additional instructional time, while continuing standards-based instruction with the class.

The additional time is a remediation opportunity for 5th grade skills, giving the student the opportunity to gain those building block skills while simultaneously working through on-grade level content with their class. This course uses the 5th grade EOG sequence to focus on skills and objectives that were failed the previous spring.

State Curriculum Skill Building can be scheduled at any time during the week – before/after school, special or activity periods, lunch hour – but must be made available to all students in the group.

Recommended additional time is one hour per week per subject; preferably in 30 minute daily sessions.

EOG Prep
Five weeks prior to the EOG test, all students move into intensive EOG Prep. This is a more tightly aligned, targeted sequence of instruction, so while some skills and instruction may have been introduced previously, the purpose changes to focus on mastery of those skills that will be tested at the end of the grade.

When 6th grade EOG results are in prior to start of next school year, the student support team reviews the following to identify the intervention students for the beginning of 7th grade:

- EOG scores – proficiency by subject area
- Behavior – number of discipline referrals during 6th grade
- Attendance - number of days absent during 6th grade

Grade 7

Beginning of school year - all students on 7th grade State Curriculum standards-based instruction; reinforcing classroom instruction and pacing guides.

State Curriculum Skill Building - Acceleration
Intervention group is given additional instructional time, while continuing standards-based instruction with the class.

The additional time is a remediation opportunity for 6th grade skills, giving the student the opportunity to gain those building block skills while simultaneously working through on-grade level content with their class. This course uses the 6th grade EOG sequence to focus on skills and objectives that were failed the previous spring.

State Curriculum Skill Building can be scheduled at any time during the week – before/after school, special or activity periods, lunch hour – but must be made available to all students in the group.

Recommended additional time is one hour per week per subject; preferably in 30 minute daily sessions.

EOG Prep
Five weeks prior to the EOG test, all students move into intensive EOG Prep. This is a more tightly aligned, targeted sequence of instruction, so while some skills and instruction may have been introduced previously, the purpose changes to focus on mastery of those skills that will be tested at the end of the grade.

When 7th grade EOG results are in prior to start of next school year, the student support team reviews the following to identify the intervention students for the beginning of 8th grade:

- EOG scores – proficiency by subject area
- Behavior – number of discipline referrals during 7th grade
- Attendance - number of days absent during 7th grade

Grade 8

All students on 8th grade state curriculum standards-based instruction; reinforcing classroom instruction and pacing guides

Power Hour - Intervention through Classworks Benchmark Assessment
Intervention group continues with 8th grade standards-based instruction in addition to extra instructional time.

The additional instruction will be offered through a "Power Hour" during the school day, and will consist of a two-part formative assessment to diagnose/prescribe a grade level appropriate individualized learning path:
- Assessment Part 1 – Placement Test to determine best grade level placement
- Assessment Part 2 – **Classworks Benchmark Assessment (at 5th, 6th, 7th, or 8th grade based on placement) to receive targeted, skill-based, individualized learning path

The recommended time for this is one hour per subject per week. Based on amount of instruction assigned, this can take up to one-half of the school year. Students that successfully complete their prescriptions prior to the semester halfway point will continue with the extra time, but move into the next grade level state curriculum assignment.

At semester, all students are reviewed by the student support team for their placement for the 2nd half of the school year. Placement decisions are based on:

- Student Progress Report – skill mastery, time-on-task
- Progress toward grade-level proficiency
- Behavior – number of discipline referrals 1st semester
- Attendance - number of days absent 1st semester

Students will then be given a second two-part assessment to determine their second semester learning path.

- Power Hour A – If 1st semester Classworks performance has shown slow progress but mastery of skills, students will continue with their original CBA prescribed instruction
- Power Hour B – All other students will take the two-part formative assessment to diagnose/prescribe a grade level appropriate individualized learning path:
    - o Assessment Part 1 – Placement Test to determine best grade level placement
    - o Assessment Part 2 – **Classworks Benchmark Assessment (at 5th, 6th, 7th, or 8th grade based on placement) to receive targeted, skill-based, individualized learning path

Five weeks prior to the EOG test, all students move into intensive EOG Prep. This is a more tightly aligned, targeted sequence of instruction, so while some skills and instruction may have been introduced previously, the purpose changes to focus on mastery of those skills that will be tested at the end of the grade.

At end of school year, Student Support Team makes summer school recommendation for all students based on concept mastery as shown by the *Classworks Student Proficiency Report.*

Middle to High School Transition

High School Prep for Success
Summer School at the end of eighth grade is High School Prep, focusing on key areas where students typically struggle during the transition from middle to high school. It is not meant to be remediation but rather an opportunity to prepare for high school success.

It is recommended that this session is provided at the high school, or whatever central location is provided for the high school summer school students, as a way to begin the transition process.

Recommended instructional time is twenty hours of Classworks instruction, which could be organized as two hours per day for two weeks, one hour per day for four weeks, or other appropriate schedules that accommodate twenty hours. This instruction is designed to be intensive, so it is not recommended that it be spread out over more than six weeks.

High School Success Prep Instruction:
- Pre-Algebra - ** Ten hour course focused on pre-algebra building block skills
- Writers' Workshop - **Ten hour course with a combination of writing/mechanics skills that are automatically graded and writing prompts and projects which will be produced through Classworks, but graded by the teacher

OR
- Recreational Reading Review - ** Ten hour custom sequence of appropriate reading instruction designed to develop and remediate comprehension skills for older students, leading to better performance in the content areas.

All students take Pre-Algebra plus one of the language courses; choice of emphasis for the Writing or Reading subject area is determined by the Student Support Team.

The successful completion of summer school is a time to celebrate as the students are ready to transition into their new role as high school students.

After summer school and before the start of the next school year, there is a "Pre-HS checkpoint" whereby the Student Support Team will use three measures to make a decision about placement of students in the Intervention Group as they move into high school:
- EOG Results – including bubble kids and those that failed but were promoted
- Summer School Attendance
- Summer School Results

High School

Classworks instruction for high school success focuses on three transitional – gateway – courses. Success in these courses is a critical transition point and a high predictor for staying in school through graduation. The goal is success on the EOC for each course and building the skills necessary for gaining additional credits toward graduation.
- English I
- Algebra I
- Geometry

Grade 9

For those students who have shown past success and have not been placed in the intervention student group, use of Classworks is recommended to supplement classroom standards-based instruction. The recommended implementation for all students is a two-part program:
- Classworks state curriculum sequences as a component of the regular course instruction in block scheduling until four weeks prior to EOC test
- An EOC Classworks Blitz four weeks prior to the test administration
  - ** Classworks Blitz is a four-week intensive instructional period using and EOC custom sequence especially designed to target commonly missed skill areas

Integrated use of Classworks as part of the regular coursework outlined above is considered in addition to – not replacing - Classworks Academy.

Classworks Academy
For those students who have been identified as part of the intervention student group, attendance at "Classworks Academy" will be mandatory, and can be incorporated into the schedule to accommodate freshman seminar, bridge or paired courses and block scheduling. The goal is that the students will receive a full year of instruction resulting in two course credits – an elective in the subject area and the English, Algebra I or Geometry credit. Time recommendation is an additional daily period structured into the school day.

The first quarter of the course will be an individualized prescription representing an opportunity to remediate 8th grade building block skills before moving on to the 9th grade course content.
- ** The prescription is based on a custom 8th grade CBA – aligned to state curriculum – and focusing on commonly missed items

Just in Time Tutoring

At the end of the first quarter, intervention students will transition into "Just in Time Tutoring," a rigorous program based on any of the three courses they are enrolled in – English I, Algebra I and Geometry. If the student is enrolled in two courses at the same time, the intervention will focus on the area of greatest need.

The foundation of this program is skill by skill progress monitoring and intensive intervention to immediately address areas where a student exhibits a lack of understanding.

"Just in Time Tutoring" consists of a pairing of two Classworks sequences to address student need for every skill in the course.

1) State curriculum assignment based on the state curriculum for the course
   a.   Students take the pretest for each unit with mastery level set at 90%
   b.   Passing the pretest moves the student to the next unit in the alignment
   c.   Failure to master the pretest (most likely as this may be the first time the student is exposed to the instruction) will take the student directly to the instructional activities within the unit
   d.   Teacher intervention is turned on in this sequence, and is triggered any time a student fails to master two activities within the unit. At this point, there is a series of steps for teacher response:
      i.   Upon first TI notification – have one on one discussion of the concept not mastered, review time on task student spent on the activity, and return to the unit to attempt successful completion
      ii.   Upon second TI notification – move the student directly into the remediation activities for that unit for a more basic instructional approach to the concept; followed by an opportunity to take the post-test to demonstrate mastery
      iii. Upon third TI notification – rather than continuing with this unit when the skill level is clearly too difficult, the student will be routed to the Building Blocks to Algebra/Geometry/English custom sequence described below, to work through the building block skills associated with this unit only

2) ** Building Blocks to Algebra/Geometry/English
   a.   This is a custom sequence with pre-designed units corresponding to every unit in the state curriculum course
   b.   The custom units contain building block skills from 6th, 7th and 8th grade activities, designed to remediate and prepare the student for successful mastery of the high school concept
   c.   Building Blocks sequences are set to manual mode so that the student may easily transition in and out of this sequence on a unit by unit basis; and only after failure of the corresponding state curriculum unit
   d.   After mastery of the unit, the student returns to the state curriculum sequence armed with the requisite skills to learn the higher level content

While formative assessment and progress monitoring is frequent and ongoing throughout "Just in Time Tutoring" the next checkpoint occurs at the end of the course.

The basis for this checkpoint is "pass/fail" on the End of Course Test. If the student has successfully passed the EOC, there is no additional recommendation. If the student fails the end of course test, they will have an opportunity to get intensive instruction in preparation for the retest – either through after-school, summer school, or an additional elective period.

Success on the EOC is an important opportunity to celebrate and represents a milestone on the journey to graduation.

Gaining Course Credit

Consistent with guidance on retests and review to determine whether the student has met the exit standard for the course, this coursework will focus only on those standards from the EOC where the student has proved deficient. In short, this will not be a repeat of the full course, but targeted instruction on identified areas of need.

Students may prepare for the retest and be deemed to have met exit standards through this process if they have already completed the Just-in-Time Tutoring for the course, and subsequently failed the first EOC.

1. **This course consists of a custom sequence based on the strands within the EOC test.
   a. There is no opportunity for pretests in this sequence
   b. Units are shortened, with fewer activities presented
   c. The sequence is organized by EOC strand for easy, focused assignment to students
2. Only those strands which were failed on the EOC test will be assigned
3. Student will work, self-paced, through their assignment
4. Exit standard has been met if the student receives a 65% or higher score on the *Classworks Report Card* upon completion of all assigned instruction

Grade 10

Classworks Academy

As students enter the 10th grade, they will continue to take "Just in Time Tutoring" for each of the three courses they are enrolled in – English I, Algebra I and Geometry. The process follows the above outline for each course.

Any subject area passed on the test is celebrated as success and does not need to be revisited. We recommend a formal celebration that gives these students an opportunity to shine based on their hard work and achievement. This is a tremendous stepping stone toward their high school graduation.

SUMMARY

There is no question about the truth behind the cliché – children ARE our best resource. It is critical that our youth do not become statistics, but that they grow to provide leadership and contribute to both local and global communities and workforce. By giving students the academic foundation they need and the tools to build on those skills, we are giving them an opportunity to have a voice in their future.

Classworks Research

Classworks™
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