



Scores up. Standards met.™

The Research Foundation of Buckle Down Publishing

Introduction

Buckle Down Publishing encourages all members of the educational community to base curriculum decisions on proven performance. In an effort to discourage the purchase and use of inappropriate and ineffective programs, the No Child Left Behind Act of 2001 requires educational materials to reflect scientifically based research. Backed by a strong 24-year performance record and research base, Buckle Down materials meet relevant federal guidelines for the purchase of materials related to No Child Left Behind, Reading First, and Title 1 funding.¹

The What Works Clearing House, established in 2002 by the United States Department of Education's Institute of Education Sciences, cautions that "No single Study Report should be used as a basis for making policy decisions because (1) few studies are designed and implemented flawlessly and (2) all studies are tested on a limited number of participants, using a limited number of outcomes, at a limited number of times, so generalizing from one study to any context is very difficult."²

For more than two decades, Buckle Down has worked with hundreds of school districts around the country to improve performance on standardized tests and state assessments. A growing body of empirical evidence demonstrates conclusively that Buckle Down materials help students master state standards and succeed on state tests. State departments of education now collect and report data indicating annual improvement in schools and districts that use Buckle Down materials.

The research foundation of Buckle Down has three primary aspects:

First, there is a constant, aggressive investigation into the intentions and interpretations of the learning objectives or standards defined by each state. By monitoring each state's standards, Buckle Down ensures its customers that Buckle Down materials are as appropriate, effective, relevant, and up-to-date as possible.

Second, there is continuous scrutiny of current research and educational practices, leading to the development of the most effective means for students to review standards-based instruction and practice test-taking skills.

Third, performance results related to Buckle Down materials are continuously collected by schools, school districts, and state departments of education. These reports are monitored and evaluated to document Buckle Down's role in enhancing student performance, and to guide development of new Buckle Down materials.

1 <http://www.whatworks.ed.gov/> or <http://www.ed.gov/nclb/methods/whatworks/doing.html>

2 <http://www.whatworks.ed.gov/>

I. Analysis of State Standards

Buckle Down’s Research Department monitors standards-setting efforts in all 50 states and the District of Columbia on a regular basis. This enables our editors and staff to stay current with developments in each state and produce materials in line with current state standards, educational practices, and testing initiatives. In some states these efforts are limited to reading, mathematics, and science. In others, they include a broader range of subjects including writing, social studies, arts, and technology.

Our research has concluded that state standards

- tend to be flexible and changing rather than fixed;
- vary in their clarity, coverage, and ease of use by teachers;
- reflect the current thinking of committee members or state department officials;
- are intended to provide a foundation for effective teaching, learning, and assessment.

As individual states developed their standards, there was no initial way for them to compare their work with that of other states. More recently, organizations such as Achieve, McREL, the Council for Basic Education, and the Thomas B. Fordham Foundation have rated states’ standards, offering opportunities for states to receive an impartial evaluation of their standards or information on how to improve them. As the following extract demonstrates, some common problems affect many states’ standards—and standards-approval processes.

[S]tates do not have to be stuck with their existing standards, even if substantial work went into creating them originally and winning acceptance of them by educators and the public. This is vital because, despite improvements some states have made, common flaws in many states’ standards persist. Some states’ standards remain too broad or vague to guide teachers in building their lessons. More disturbingly, they remain less rigorous than the expectations routinely set for students in the highest-performing nations. Too often, volume has been confused for rigor. In some cases, states have added concepts and skills to try to “cover” everything, without making the tough choices about what is most important for students to learn. In other cases, standards are repeated grade after grade with no signal of the progression of knowledge and skills that should mark students’ academic growth. To remain at the center of school improvement, particularly in the minds of parents and the public, standards need to be focused on essential content, written in plain English and illustrated with examples of student work.³

The editors at Buckle Down Publishing apply their expertise to synthesizing, clarifying, and presenting all the complexity of any given state’s standards in a way that allows the teacher to focus test-preparation time in the most efficient way possible.

³ Achieve, Inc. *Staying The Course: Standards-based Reform in America’s Schools: Progress and Prospects*. Washington, DC: Achieve, Inc., 2002. p. 6

Pedagogical Theory and Research Findings

Reading

Through consistent review of recent pedagogical findings, the editors align Buckle Down materials with the methods for teaching reading that have produced the best results. Recent scientifically based research studies have shown that successful reading programs include the following five elements:

- Phonemic Awareness
- Phonics
- Fluency
- Vocabulary
- Text Comprehension⁴

No Child Left Behind requires that all reading materials for beginning readers purchased with Reading First or Title 1 funds be based on these five scientifically based components of early reading instruction. The International Reading Association has published a position statement entitled *What Is Evidence-Based Reading Instruction?*⁵ This statement draws evidence from *The First-Grade Studies*, a federally funded investigation of methods of teaching reading, as it points to the need for a diverse, flexible approach to teaching reading: “No one approach is so distinctly better in all situations and respects than the others that it should be considered the one best method and the one to be used exclusively.”⁶

In regard to teaching phonics, some experts have determined that approximately two years of phonics instruction is sufficient for most students.⁷ The editors tightly align Buckle Down phonics materials for the primary grades with the pertinent learning standards from the individual state’s curricular requirements.

Children learn vocabulary, another critical reading component, both indirectly and directly: indirectly, through interactions with adults such as conversations or being read to, or reading on their own; directly, from teacher-led instruction. To reinforce this method, Buckle Down lessons include the use of reference tools, information about roots and affixes, and contextual clues. Buckle Down reading materials for elementary, middle school, and high school levels focus on vocabulary as an important component in building successful reading and comprehension skills. Buckle Down’s test-taking tips are customized to represent an individual state’s reading standards. Upper-level materials from Buckle Down include additional practice on text comprehension to probe the more complicated themes found on those tests.

4 National Reading Panel. *Teaching Children to Read*. National Institute of Child Health and Human Development, 2000. <http://www.nichd.nih.gov/publications/nrp/smallbook.cfm> and the companion piece, Armbruster, B. B., Lehr, F., & Osborn, J. *Put Reading First*. Center for Improvement of Early Reading Achievement; National Institute for Literacy, 2001.

5 See their Website: http://www.reading.org/resources/issues/positions_evidence_based.html for information on examining evidence to support certain programs and practices.

6 Bond, G. L., & Dykstra, R. “The Cooperative Research Program in First-Grade Reading Instruction.” *Reading Research Quarterly*, 32 (1997; original work published 1967): 416

7 Armbruster, B. B. “Research-Based Instruction in Reading.” Presentation at Regional Department of Education Meetings, 2002.

Additional techniques that researchers have documented as helpful for readers of all levels include reading well-written and engaging texts, summarizing materials read, creating graphic organizers, and putting events in chronological order.⁸ All the above features are prominent in Buckle Down's materials. Common among other publishers is the practice of running through the standards in the order given by the state. Buckle Down rearranges the standards in a pedagogically sound order, progressively building on prior knowledge as the lessons progress.

Research also indicates the importance of involving parents in supporting and encouraging their children's reading habits. Buckle Down's student workbooks are particularly well suited for at-home work, where parents and children can work together reading a selection, reviewing the content, and testing the reader's comprehension. The low cost of Buckle Down materials, along with their ease of use, makes them an important tool that parents can use to monitor and assist their children's reading progress.

Mathematics

According to Russell Gersten's presentation at the February 6, 2002, seminar on scientifically based research sponsored by the United States Department of Education, there are currently four distinct elements of mathematics programs proven to be most effective in the classroom. These include programs and curricula that provide the following:

1. ongoing information to students as to where they are in meeting state math standards
2. peer assisted learning
3. explicit instruction with an array of examples
4. real-world problems that use math⁹

Buckle Down materials encompass all the above elements, and they are especially good for providing ongoing information about students' mastery of standards, an array of examples, and real-world problems using math. As tutoring aids, the materials are also appropriate for use in a peer-assisted learning environment.

The Learning First Alliance cites seven criteria necessary to achieve a more challenging math curriculum for all students:

1. Specify clear benchmarks and provide for more focused and challenging study of math; materials and assessments should be aligned with these benchmarks.
2. Eliminate dead-end tracks in math curricula.
3. Create grade-by-grade curriculum guides aligned with state benchmarks.
4. Assure that all schools have challenging math curricula for all students.
5. Study how technology can further student learning in math.

8 Learning First Alliance. *Every Child Reading: An Action Plan*. (1998) <http://www.learningfirst.org/lfa-web/rp?pa=doc&docId=46>.

9 Gersten, R. *Math Education and Achievement*. Presentation to a United States Department of Education seminar on scientifically based research (February 6, 2002). http://www.ed.gov/nclb/methods/whatworks/research/page_pg6.html

6. Develop clear, consistent, regularly administered assessments to monitor student progress toward benchmarks.
7. Increase the percentage of students achieving at the highest levels.¹⁰

In light of these seven, Buckle Down math materials provide

- materials and assessments aligned to benchmarks;
- standards tables mapped to individual lessons, which clarify often-confusing state standards;
- grade-by-grade curriculum aligned with state benchmarks;
- clear, consistent assessments to monitor students' progress toward benchmarks;
- documented proof of increased math proficiency after using Buckle Down products.

As the 2003 RAND Mathematics Study Panel notes, “The absence of cumulative, well-developed knowledge about the practice of teaching mathematics and the limited links between research and practice have been major impediments to creating a system of school mathematics that works.”¹¹ Nevertheless, the study based its report on mathematical proficiency included in five intertwined strands:

1. Conceptual understanding—comprehension of mathematical concepts, operations, and relations
2. Procedural fluency—skill in carrying out procedures flexibly, accurately, efficiently, and appropriately
3. Strategic competence—ability to formulate, represent, and solve mathematical problems
4. Adaptive reasoning—capacity for logical thought, reflection, explanation, and justification
5. Productive disposition—habitual inclination to see mathematics as sensible, useful, and worthwhile...¹²

Once again, Buckle Down materials deliver exactly what students need to master these intertwined strands, as reflected in an individual state's math curriculum framework. Each lesson breaks down the mathematical concepts required by the state standards into comprehensible steps. Numerous examples for each concept use an algorithmic approach that demystifies each task for the struggling learner. Buckle Down materials reinforce the logic of mathematical concepts, giving students the keys to adaptive reasoning, and they take every opportunity to use real-world, often state-specific examples to demonstrate the usefulness and worth of mathematical endeavours.

10 Learning First Alliance. *Every Child Mathematically Proficient: An Action Plan of the Learning First Alliance*. (1998) <http://www.learningfirst.org/publications/math/>

11 RAND Mathematics Study Panel. *Mathematical Proficiency for All Students*, 2003.

12 RAND Mathematics Study Panel, 2003.

Writing

There is a large body of research documenting the many benefits of using writing to teach reading. Mary Heller notes that, through integrating reading and writing, students develop a more stable concept of the written word: “If we take an integrated approach, which emphasizes reading-writing connections, we are primarily concerned with an interactive viewpoint: Reading and writing are the processes of constructing meaning from and with print, respectively.” Additionally, she writes that “four stages of both reading and writing processes provide the framework that supports a fully integrated curriculum. Prereading and prewriting, reading and writing, rereading and rewriting, and postreading and editing stages are recursive in nature. That is, each stage of the process overlaps onto another again and again as the reader/writer actively constructs meaning through print.”¹³

Writing research has found that process models—wherein students plan, draft, revise, edit, and publish their writing while working in small groups—produce positive effects. Teaching students to write for different audiences and purposes, and providing instruction in basic mechanics and the editing process is also helpful.¹⁴

These practices are found in Buckle Down writing books and can be very helpful in assisting students with reading improvement as well.

Research-Based Educational Practices

Buckle Down materials also incorporate and refine research-based educational practices that help teachers provide interesting and challenging instruction; the materials are not only student-friendly, but they also help motivate students to learn state standards and develop the confidence to demonstrate what they know on state-mandated assessments.

Some examples of research-based techniques found in Buckle Down materials include:

- Standards-based practice tests—Practice tests give students the opportunity to demonstrate their test-taking skills on instruments focused precisely on a given state’s assessment. The practice tests also help teachers isolate specific standards on which students need more preparation or instruction.
- Test-taking strategies—Test-taking hints are important for all students to learn and use so that they can accurately demonstrate what they know on state assessments. Direct practice on similarly formatted practice tests has been shown to improve students’ standardized test scores.
- Use of assessment formats—Research has shown a significant improvement in the scores of students who have received instruction in the same format (fonts, leading, kerning, and so on) as that of the assessment tool. The formatting of Buckle Down’s practice tests and end-of-lesson practice sections mirror that of the state assessment as closely as possible, and so allow students to take advantage of this opportunity to increase their scores.

13 Heller, M. F. *Reading-Writing Connections: From Theory to Practice*. New York: Longman, 1991, 65

14 Learning First Alliance, *Every Child Reading*, 1998

Research on Practice Tests

The use of formative tests to give students practice opportunities, and teachers more information about students' strengths and weaknesses, is well documented. Simmons points out that teachers can help students perform well on standardized tests by demystifying tests, making testing congruent, administering more multiple-choice tests, and using the results to improve teaching and learning.¹⁵

If students take standardized tests, schools have an obligation to ensure they have as much advance preparation as possible. Teachers in particular must be intimately familiar with the types of tests required for their students. They must then strive to make their own classroom evaluation procedures dovetail with the standardized tests administered to their pupils. Thus, the format of tests, the kinds of items used, and the testing procedures involved become matters of critical concern.¹⁶

In addition, Gandal and McGiffert state that "Educators ... get the best information about their students when they compile data from a number of sources, including classroom assignment, quizzes, diagnostic tests, and large-scale assessments. Together, these tools paint a fuller picture of student performance."¹⁷

Research on Test-Taking

Teaching test-taking tips and strategies has been studied and found to be effective in increasing test validity and students' scores. Johns and Van Leirsburg reported that teaching "test-wiseness" is effective according to research: "Minority, foreign, culturally different, and special education populations may differ from the norm in their test-taking strategies, resulting in score differences due to factors extraneous to the intended content measured by the test."¹⁸ However, the authors indicate "research suggests that test-taking skills can be learned. Special populations of students have been shown to benefit in the ability to improve their test scores when intervention programs include test-taking skills."¹⁹ Furthermore, research demonstrates that most students learning test-taking skills scored much higher than students of equal ability levels who had not had the experience.²⁰

Teaching students how to take tests is useful for students of all ages, beginning with the elementary grades. Gloria Hoyos indicated she found that strategies to help elementary students become more confident and prepared for tests included reviewing sample tests and common test formats, and focusing on strategies for specific subject areas. Her strategies for specific disciplines, all of which are included in Buckle Down materials, include the following:

Reading

- Go beyond the familiar and use a variety of reading materials.
- Teach students to increase comprehension by backing up interpretations with reasons.
- Teach students to articulate the reading strategies they use and help them develop higher-order thinking.

15 Simmons, J. "The Importance of Being Tested." *Kappa Delta Pi Record* 34, no. 4 (Summer, 1998): 129–131.

16 Simmons, 131

17 Gandal, M., & McGiffert, L. "The Power of Testing." *Educational Leadership* (February, 2003): 41

18 Johns, J., & Van Leirsburg, P. "Teaching Test-Wiseness" *Reading Psychology* 13, no. 1 (1992): 99

19 Johns & Van Leirsburg, 101

20 Berliner, D., & Casanova, U. "Should Students Be Made Test-Wise?" *Instructor* 95, no. 6 (February, 1986): 22–23.

Math

- Give a daily quiz to reinforce what students have learned.
- Pose a daily math challenge.
- Have students write their own word problems and generate their own graphs, charts, and schedules.

Writing

- Practice with different types of writing prompts.

Science

- Help students “think like Sherlock Holmes” by sharpening their eye for details.
- Provide hands-on investigations.

Social Studies

- Have students discuss and write about matters that do not have right or wrong answers.
- Encourage students to develop different points of view and a healthy skepticism.

Without some general test-taking skills under their belts, students can miss questions they know because they don't understand the mechanics of the test. To help my students be less intimidated by the very appearance of the exam, I share a variety of short sample tests with them. (You can get these practice tests from commercial publishers or from your district testing coordinator, or you can develop your own.) I have found that when students practice taking multiple-choice tests in different content areas at a level that is easy for them, they can concentrate on the mechanics of the test and not worry so much about the content being tested.²¹

Studies show that most students benefit from instruction in how to take tests. However, Scruggs and Mastropieri found that students particularly likely to benefit from test-taking skills education include younger students, low achievers of all ages, minority students, and students from lower socioeconomic backgrounds.²²

21 Hoyos, G. “Help Your Students Beat the Testing Game.” *Instructor* 105, no. 5 (January/February, 1996): 65

22 Scruggs, T. E., & Mastropieri, M. A. *Teaching Test-taking Skills: Helping Students Show What They Know*. Cambridge, MA: Brookline Books, 1995.

3. Performance Research

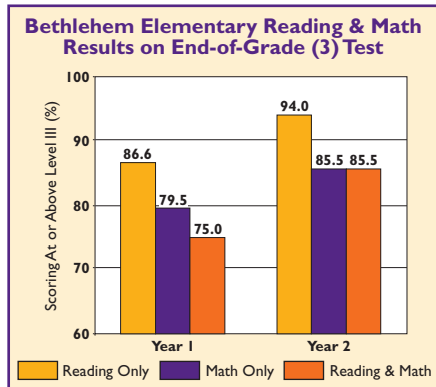
In addition to the pedagogical and developmental research, Buckle Down Publishing is continually striving to document the usefulness and effectiveness of its materials. Since 1992, the results of state testing in hundreds of school districts demonstrate conclusively that the Buckle Down materials are effective tools for improving student performance. Even though state departments routinely collect and publish data indicating successful school experiences, Buckle Down continues to encourage districts to conduct their own internal research.

The body of empirical evidence continues to grow as districts make a greater effort to document successful efforts. The following results and comments offer a sampling of the progress made by schools and districts using Buckle Down materials. For additional information, please contact the Director of Research at Buckle Down Publishing.

Evidence of Effectiveness

Results of pretest/posttest comparisons for Buckle Down materials

Table 1: Bethlehem School, Taylorsville, North Carolina

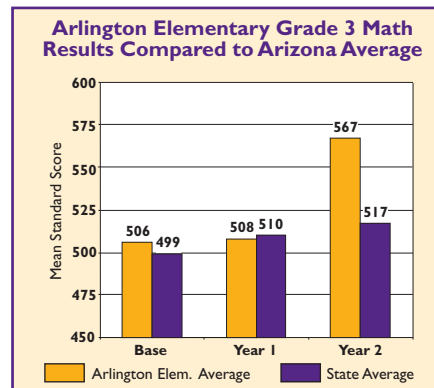
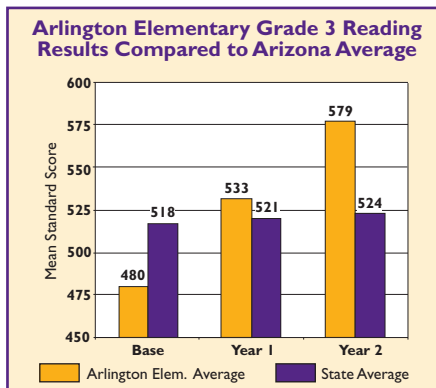


Bethlehem School in Taylorsville, NC, saw its third grade End-of-Grade (EOG) scores improve in both reading and math after using Buckle Down workbooks and diagnostic tests. Sandra Bollinger, a third grade teacher at Bethlehem School used Buckle Down materials and noted, “Having used the 3rd grade *Blast Off* series for a number of years, I have been impressed with how beneficial it is to review content that we have covered and to give a preview of some materials.”

Data source: North Carolina Department of Public Instruction

Tables 2 and 3: Arlington Elementary School, Arlington, Arizona

The *Arizona Republic* featured Arlington schools in its September 9, 2002, edition. The article, “Rural Pupils Ace AIMS,” noted that small, rural school districts like Arlington could be as successful as more wealthy school districts in raising student scores on the state test. Arlington “scored high enough in reading and math to land in Maricopa County’s top 10 . . . sharing the honors with third-graders in the best suburban schools.” Arlington Elementary began using Buckle Down materials during the 2000–2001 school year.

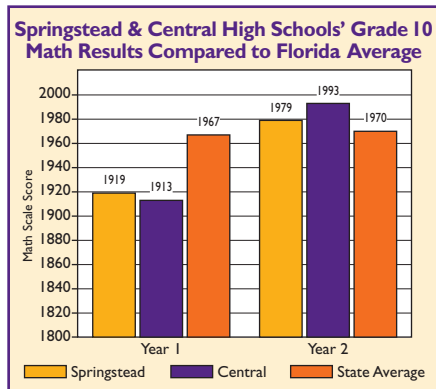


Data source: Arizona Department of Education

Evidence of Effectiveness (continued)

Results of pretest/posttest comparisons for Buckle Down materials

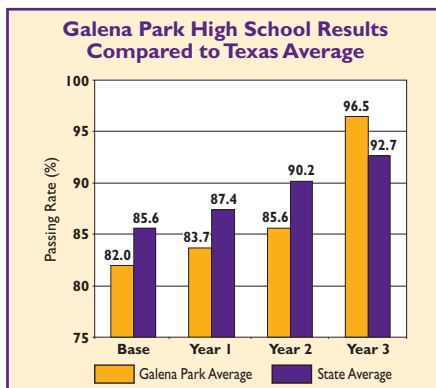
Table 4: Springstead High School and Central High School, Hernando County, Florida



Two high schools in Hernando County, Florida, were recognized in the *St. Petersburg Times* on May 16, 2003, for their achievement in improving their FCAT scores. The article, “Lower Grades Rank High on FCAT,” reports that, “Among the county’s high schools, Central and Springstead students exceeded the average state math FCAT score in both 9th and 10th grades.” These two high schools have been using Buckle Down materials for the past two years.

Data source: Florida Department of Education

Table 5: Galena Park High School, Texas



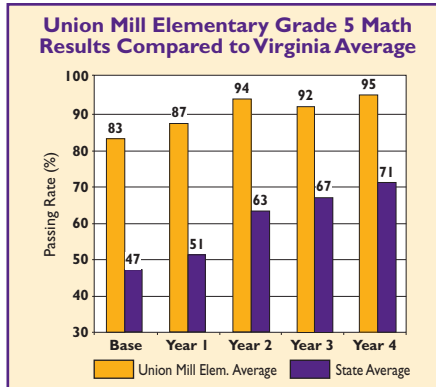
After using Buckle Down materials for a few years, Galena Park High School in Texas was able to raise its reading scores on the Texas test from below the state average for high school reading to above the state average. Principal Marsha Masi describes Buckle Down materials: “Wonderful product! We used it extensively for our TASS Star Catcher Academy. Our results on TAAS were great.”

Data source: Texas Education Agency

Evidence of Effectiveness (continued)

Results of pretest/posttest comparisons for Buckle Down materials

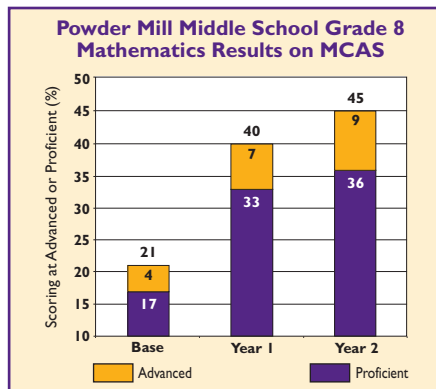
Table 6: Union Mill Elementary School, Fairfax County, Virginia



Union Mill Elementary School began using Buckle Down materials in 1999. Over the following four years, the school saw its 5th grade mathematics scores increase on the Virginia SOL Test, and the school continued to beat the Virginia statewide passing rates for 5th grade math.

Data source: Virginia Department of Education

Table 7: Powder Mill Middle School, Southwick, Massachusetts



Powder Mill Middle School began using Buckle Down materials during the 1999–2000 school year. As depicted in the graph, Powder Mill saw its 8th grade math scores in both “advanced” and “proficient” categories increase dramatically.

Data source: Massachusetts Department of Education

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Massachusetts: <http://www.fldoe.org/>

North Carolina: <http://www.dpi.state.nc.us>

Virginia: <http://www.pen.k12.va.us>

Texas: <http://www.tea.state.tx.us>

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