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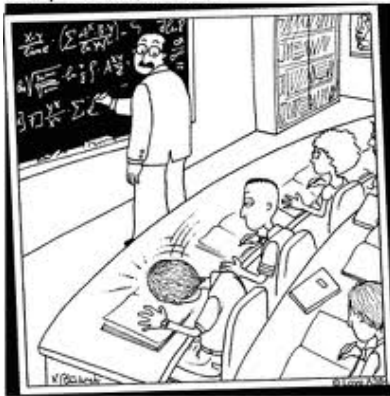
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Snapshots at [jasonlove.com](http://jasonlove.com)



Professor Herman stopped when he heard that unmistakable thud – another brain had imploded.

# Teachers Workshop

*“Information for everyday teaching”*

## Common Core State Standards: Impact of the Standards in Mathematics

Darlene E. Crane, M.Ed

The statistics have been alarming. While throughout much of the twentieth century the United States led the world in the areas of mathematics and science, current trends indicate that the U.S. is distinctly at risk of losing this leadership position in the twenty-first century. In fact, the National Mathematics Advisory Panel reported only 23% of U.S. students are proficient mathematically at Grade 12 as measured by the National Assessment of Educational Progress. Since then, educational professionals across the nation have recognized the critical need to increase mathematics achievement for students in the United States. In fact, data from the National Assessment of Educational Progress indicates that fourth and eighth grade students are performing at historically high levels and the trend data demonstrate a distinct positive trend. Further, the development of the Common Core Standards may prove to be one of the most significant elements of educational reform in mathematics instruction in recent years.

The Common Core State Standards Initiative has been a state led effort coordinated by the National Governors Association Center for Best Practices and the Council of Chief State School Officers ([www.corestandards.org/the-standards/mathematics](http://www.corestandards.org/the-standards/mathematics)). The efforts of teacher leaders, school administrators, and experts from the field have resulted in a comprehensive, coherent set of standards that will empower educators, parents, and students to clearly identify the learning goals for each grade level. Especially critical is the development of the mathematical standards that reform the nation's math curriculum to align with standards that have proven most effective from highly successful states and our international counterparts. These standards, coupled with Mathematical Practices which are the over-arching mathematical expertise that students should develop across all programmatic levels, provide educators a common language and set of expectations. The mathematics standards and practices clearly align with the National Mathematics Advisory Report in several critical areas, as follows:

*Stress procedural fluency, conceptual understanding, and higher-order problem solving;*

*Are clear and concise, provide focused, clear progression of learning across grade levels;*

*Develop foundational skills necessary for students to be successful in algebra;*

*Provide a multi-state alignment of what is to be taught at each grade level; and,*

*Prepare students for entry level post-secondary college mathematics courses and work-force training.*

## Meet Dr. Richard Ramsey ...



Dr. Richard Ramsey is the most dynamic, highly-motivational presenter we have in education. He has served 36 years in education as a teacher, coach, athletic director, vice-principal, principal and consultant. Having worked in education from kindergarten through 12<sup>th</sup> grade, his experiences and background enables him to relate to children, youth, and their families and offer guidance to assist them in living in our challenging society.

This nationally known, respected author and gifted speaker has traveled extensively throughout the United States. His highly acclaimed messages combine real life experience with humor to create high quality, high energy programs. His eloquent delivery and content captivate, empower, motivate, inspire, and educate the listener.

Dr. Ramsey's philosophy is very simple: ***"Never forget how you got to where you are and remember someone helped you get there."***

To arrange for Dr. Ramsey to present at your school or district please contact the Teacher's Workshop at 800-991-1114

## Quote of the Month...

"The only service a friend can really render is to keep up your courage by holding up to you a mirror in which you can see a noble image of yourself."  
-George Bernard Shaw

## Mind Teaser...

What falls but does not break, and what breaks but does not fall?  
(answer at top of last page)

The adoption of the Common Core Mathematical Standards or the adoption of a closely aligned set of state standards prepares states to significantly increase student mathematical achievement in the United States. To date, 44 states have adopted the Common Core standards.

In addition, recommended practices for mathematics instruction are included on the Common Core State Standards website. These mathematical practices address the critical areas of math expertise students should develop across programmatic levels, and will have a significant impact on classroom mathematics instruction. In addition, given that these practices reach across all grade levels, the mathematical practices can serve as a catalyst for very rich grade level and vertical teaming experiences in a professional learning community environment. As a first step in the preparation for the transition to the Common Core Mathematics Standards, professional learning communities could set the goal of developing a thorough understanding of the Mathematical Practices and the integration of these practices in mathematics instruction across grade levels.

A description of each practice provides teachers an insight into how the complexity of the practices increases through programmatic level and how the instructional practices at their particular grade level impacts student achievement in subsequent years. Mathematical practices require rich, varied, instructional approaches; the exclusive use of teacher-directed instruction will not allow students to fully develop ownership of these practices. In addition, the exclusive use of student-directed learning experiences will not be sufficient either. Teachers will need to strategically integrate a variety of experiences to allow all students the opportunity to master the mathematical practices. A brief overview and explanation of the eight Mathematical Practices as outlined in the Common Core Standards is provided below.

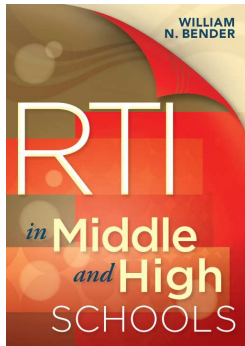
***Make sense of problems and persevere in solving them.*** Research reviewed by the NMAP (2008) indicated that student beliefs about learning impacted math achievement. The report specifically recommended that teachers consistently reinforce the positive impact that students' effort has on math achievement. This mathematical practice integrates that recommendation in the sense that students from the earliest grades are expected to develop sense of the problem, and find "entry points" or first steps in solving the problem. In addition, mathematically proficient students develop a plan for solving problems and are able to flexibly adjust the path as necessary to successfully solve the problem. Students will be able to understand other's solutions to complex problems and see the corresponding elements to successful solutions. It is critical teachers provide students at even the earliest grades, opportunities to wrestle with problems and discover various solution paths that successfully answer the problems. When developing this mathematical practice, teachers should ask well developed questions to prompt thinking as opposed to providing answers or models. This practice not only fosters flexible critical thinking, but also facilitates students' willingness to persevere and try various solutions to a problem. The willingness to work through difficult problems is certainly a skill that will serve students well across settings.

***Reason abstractly and quantitatively.*** The second mathematical practice teachers should embed into instruction and develop in students is the ability to make sense of quantities and their relationship in problems. In addition, students need to develop the ability to represent quantities abstractly and represent situations symbolically in a coherent manner. Students should understand the meaning of the quantities, the relationship of the quantities to the situation, and be able to flexibly use the properties of operations. While this is a complex task,

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## Featured Book: RTI in Middle & High Schools

By William N. Bender, Ph.D.



Dr. William Bender has written more books on RTI than any other author in the world! This exciting new book addresses practical “how-to” questions on implementation of RTI and differentiated instruction in middle and high schools. Descriptions of model programs in high schools and middle schools that have actually done it successfully are featured as well as discussion points for the RTI leadership team to consider. When are tier 2 and tier 3 interventions scheduled? What is done for screening in the upper grade levels? These and many other questions are answered, in this must have book on RTI!

**To order this book contact Teacher's Workshop at 800-991-1114**

### Wacky Bumper Stickers...

Here is a series of strange, but true bumper stickers seen around the country...

- ♦ CAUTION! I Drive Like You Do!
- ♦ I'm Back By Popular Demand
- ♦ They're Not Hot Flashes, They're POWER SURGES!
- ♦ The Big Bang Theory: God Spoke and BANG It Happened
- ♦ I Still Miss My Ex-Husband, But My Aim Is Improving
- ♦ I Almost Had A Psychic Girlfriend, But She Left Me Before We Met
- ♦ I Drive Way Too Fast To Worry About Cholesterol
- ♦ Hang-Up And Drive!
- ♦ Pardon My Driving, I'm Reloading
- ♦ Despite The Cost Of Living, Have You Noticed How It Remains So Popular?

elements of the practice should be embedded into instruction at even the earliest grades.

*Construct viable arguments and critique the reasoning of others.* Students as part of their mathematical experiences should develop the ability to justify their solutions, communicate their ideas and strategies to others and be able to respond to questions and arguments from others. Students who are proficient with this practice are able to compare the effectiveness of plausible arguments and determine if conjectures are logical or flawed. If conjectures are flawed, students should be able to ask questions to clarify. Across programmatic levels, students can develop the ability to listen or read the explanations of others and decide if the explanation makes sense.

*Model with Mathematics.* Integrated into the mathematical content, students should become proficient in applying the mathematics they know to solve problems in everyday life. Students proficient in this practice are able to map relationships between problem and solution through the use of diagrams, two-way tables, graphs, flow-charts, formulas or even simple equations. Students should through the programmatic levels become comfortable making assumptions and approximations, knowing that these may need to be refined in order to successfully identify and map the solution.

*Use appropriate tools strategically.* At each level, students should develop a thorough enough understanding of available math tools, including technology based on resources, to consider the availability, the benefits and limitations of the tool in relation to the situation at hand. Students should also be able to determine when a tool presents a limitation, and what combination of tools may be most efficient for their use.

*Attend to precision.* Mathematically proficient individuals are able to recognize the need for precision in situations. Students should develop the ability to communicate precisely to others including stating the meanings of mathematical symbols. Proficiency includes the need to carefully identify the units of measurement, label axis, and calculate accurately and efficiently.

*Look for and make sense of structure.* This mathematical practice creates in students the ability to look for patterns in situations. Proficient students can sort various elements of a mathematical situation and identify the relationships. Students proficient in this practice have the ability to step back from a problem to identify an overview while not losing understanding of the details.

*Look for and express regularity in repeated reasoning.* This practice leads students to the ability to notice if calculations are repeated. Proficient students are able to identify general methods and look for effective and efficient shortcuts. Noticing the regularity of a method may lead students to the development of a general formula for problem solution in mathematical situations.

This is merely a brief description of these practices, and teachers should review the complete description of the mathematical practices at the Common Core website below. While the mathematical practices serve as a powerful catalyst for strategic use of instructional activities in mathematics classrooms, they must be linked to the mastery of the mathematical content of the Common Core Standards. However once the linkage is made the Common Core Standards in mathematics represent a good step forward for math.

## Answer To Mind Teaser...

Night and Day.

### Did You Know...

- ♦ Hershey's kisses are called that because the machine that makes them looks like it's kissing the conveyor belt.
- ♦ The longest recorded flight of a chicken is thirteen seconds.
- ♦ An ostrich's eye is bigger than its brain.
- ♦ "I am" is the shortest complete sentence in the English language.
- ♦ A duck's quack doesn't echo, and no one knows why.

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## References and Resources

*National Mathematics Advisory Panel (2008). See the report at: <http://www2.ed.gov/about/bdscomm/list/mathpanel/report/final-report.pdf>*

*Common Core State Standards: See the standards at: <http://www.corestandards.org/the-standards/mathematics>*

*National Council of Teachers of Mathematics: See the website: <http://www.nctm.org/about/content.aspx?id=25186>*

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*Ms. Darlene Crane is a veteran educator with many years in the classroom who conducts workshops in mathematics around the United States and Canada. She is co-author of **RTI in Math: Practical Guidelines for Elementary Teachers** (2011 Solution Tree Press, Bloomington, IN). If you would like to have Ms. Crane work with your teachers, contact the Teacher's Workshop at 800-991-1114.*

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