RESEARCH BASE FOR PINPOINT MATH © 2009

There can be as many reasons for struggling in math as there are students who are struggling in math. Many sources have guided the philosophy and development of *Pinpoint Math* in its aim to reach each student who has learning gaps. Those gaps need specific identification—or pinpoints. Once identified, the ultimate goal of *Pinpoint Math* is to support success in grade-level performance. "… all students can and should be mathematically proficient." (Kilpatrick, Swafford, & Findell, 2001)

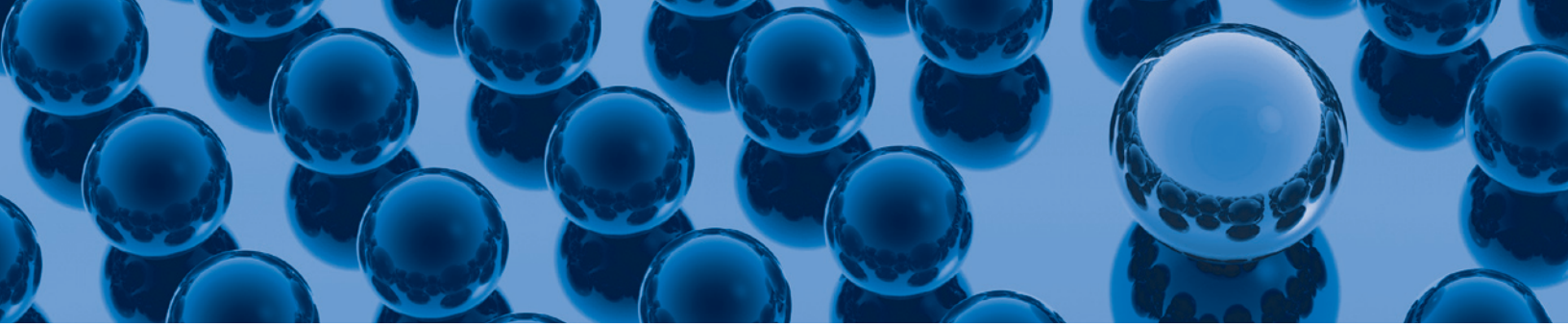
Using multiple practice opportunities (Caple, C. (1996), data-gathering through formal and informal assessments, universal access, flexible instructional planning and support that includes modeling, language practice, and the necessary scaffolding to assure comprehension, *Pinpoint Math* translates into the practical the belief that all students can succeed in math. (Dempster, 1990)

Keeping students actively involved in their learning is key to their success. The use of manipulatives in *Pinpoint Math* at the beginning of the lessons moves students from the concrete to the abstract and helps to support their success. (Heddens, 1986; Clements & Battista, 1990). Kinesthetic learners and learners whose strengths are in other modalities can visualize the concept through hands-on involvement. Animated tutorials keyed to the lessons provide an alternate format for review and additional practice.

Another key aspect of *Pinpoint Math* is the use of careful scaffolding that links prior knowledge to new knowledge through the use of diagnostic pretests, verbal and nonverbal communication, and modeling. (McTighe & O'Connor, 2005; Bransford, Brown, & Cocking, 2000.) By eliciting a student's relevant knowledge, the student can make sense of new knowledge in light of what they already know. (Shepard, L. ,2005) Eventually this leads the student to mastery of skills and to independent application of skills. (Chang, Sung, & Chen, 2002). In addition, "Error Analysis" at the beginning of each lesson helps the teacher identify and address misconceptions that can be otherwise difficult to pinpoint. (McTighe & O'Connor, 2005)

The instructional cycle of *Pinpoint Math* begins with "Assessing Prior Knowledge." Learners then move through each lesson via a simple 3-part format consisting of "Model It," "Understand It," and "Try It" pages. This consistency frees the student to focus on the content and to build self-confidence as they gain independence. When learning cycles are used in lessons, "students develop higher-level thinking skills and sound understanding of concepts." (Marek & Cavello, 1997)

For English language learners, "Scaffolding refers to contextual supports through the use of simplified language, teacher modeling, visuals and graphics, cooperative learning, and hands-on learning." (Ovando, Collier, & Combs, 2003) *Pinpoint Math* focuses on the development of academic language via multiple strategies that make mathematic language meaningful for the student. Animated tutorials provide "visual support and improved comprehension scores…" (Herron, Hanley, & Cole, 1995)



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