BLUESTREAK
math

White Paper
BlueStreak Math: Math Fact Fluency

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Most likely, you've been out to lunch and heard something like this? *"You figure the check, I'm not good at math."* Can you imagine someone saying, *"You read the menu, I'm not good at reading?"* That's the story, in a nutshell, of why mental math and math fact fluency are on the National Agenda as never before. It seems okay to *not know math*, while the idea *of not knowing how to read* is totally unacceptable.

PART I: ALL ABOUT MATH FACT FLUENCY

What is Mental Math?

Learning math facts is a math hallmark of schooling that stretches back to the 1800s. Yet, it can be an elusive cognitive skill for students, who will slip through the cracks without mastering the math fact fluency in mental math performances. It's all in your head! Mental math is simply the ability to do math facts in your mind, without the aid of paper, pencil, or calculators. It's a process that offers immediate and accurate recognition of the number combinations used in all math computations from simple addition and subtraction problems to more complex tasks that involve multiplication and division scenarios.

What is Math Fact Fluency?

Boaler (2015), a Stanford professor of mathematics education, states "There is a common and damaging misconception in mathematics—the idea that strong math students are fast math students. Math fact fluency, however, has a precise focus on mental math that is not the same as computational reasoning fluency." *Fact fluency* means knowing the math facts *mentally* and with *automaticity* and *accuracy* in order to move into the computational reasoning needed for actual math problem solving.

Math fluency is about having the *ability to do a simple math performance* in your head. In fact, according to experts, students must know their math facts *with fluency and accuracy within a specified time that ranges in the literature from 2–3 seconds to 8 seconds (Berg, 2016) or 10 seconds* noted in respected documents from the CCSS (2009), NCSM (2012), PARCC (2010) among others. Yet, many highly, proficient math students may actually consider problem solutions in a slow methodical process.

In any case, it is mental quickness and automatic responses to simple math tasks that are most important in math fact fluency, regardless of the individual pacing advances in each practice session. In comparison, the quickness in this area of math fact fluency is similar to knowing sight words in reading fluency, where the students know a set of basic, high frequency words by sight recognition. Math fluency provides the same kind of familiarity and instant recognition for students' skillfulness in math. Fluent readers are not halting, stumbling, or reversing themselves; the same is characteristic of students performing fluent mental calculations with math fact fluency.

Why is Math Fact Fluency critical?

The benefit can be striking. Students can free up their working memory with fact fluency permitting time and attention to more difficult steps and tasks in their calculations and computations. If they have to recreate simple math facts every time, math becomes tedious and taxing. If they know the facts in their mind, with BlueStreak Math speed, they can "streak" by these simple facts and proceed to the more complex parts of conceptual problem solving and logical reasoning required in math performances. The math facts have to become reflexive and flow with ease when doing mathematics processes. That factual recall is the part of the sequence that needs to be smooth and quick, streaking through the mind with lightning speed, with math fact fluency flashing through in milliseconds.

Math fact fluency is the *gold standard of math proficiency*. This simple skill of memorizing math facts that can be accessed instantly and with cognitive automaticity is a vital foundation for the study of the complex, higher-level mathematics, such as algebra, geometry and calculus (Loveless & Coughlan, 2004; NMAP, 2008; Resnick, 1983; Reys, Lindquist, Lambdin, & Smith, 2010). In fact, many experts agree that critical elements for proficient math performance include the skill of fluent recall of basic math facts. It is seminal to understanding and to the ability to perform more abstract mathematics (Baroody, Bajwa, & Eiland, 2009).

The effect on high-level math is clear. Studies have found that lack of math fact retrieval can impede participation in math class discussions, successful mathematics problem solving, and even the development of everyday life skills. And rapid math-fact retrieval has been shown to be a strong predictor of performance on mathematics achievement tests (Whitehurst, 2003).

Why is mastery of Math Fact Fluency in jeopardy?

In short, math deficit with math fact fluency impacts students' entire K–12 math experience. Failing to truly conquer math facts in addition, subtraction, multiplication, and division in the early years, preK–5, causes students to struggle with math, in general, throughout their schooling. Many develop an attitude of "I hate math" and more importantly, they are shut out of higher math classes (Eiland, 2009; Kilpatrick, Swafford, & Findell, 2001; NMAP 2008; Resnick, 1983). In his book, Why Don't Students Like School?, cognitive scientist Daniel Willingham (2009) stated "It is virtually impossible to become proficient at a mental task without extended practice" (p. 81).

The literature in Lin & Kubina, 2005; Stickney et al., 2012; Woodward, (2006), reiterates this same picture. Our math students are struggling when they are in elementary school, they are struggling when they are in middle school, and by the time they are in high school, they are years behind. This study only dealt with on-level students. Students with disabilities were not included. If the students who are supposed to be on-level are struggling, how can we expect the students with disabilities to be?

In fact, David Berg (2015) states "Unfortunately, it is conservatively estimated that 50% of students nationwide have not developed automaticity with the multiplication and division facts. The frustration, confusion, and discouragement educators and students experience when students, regardless of everybody's efforts, cannot recall the times tables, represents the greatest educational challenge in the entire K–12 math continuum".

In addition, Algebra II is regularly considered a "gateway course" for continued success in mathematics. With math fact fluency, students are prepared to continue their math journey into higher levels needed for success with high-level math achievement. A report by the Institute of Education Sciences emphasized the importance of basic, foundational math skills: "Quick retrieval of basic arithmetic facts is critical for success in mathematics. Yet, research has found that many students with difficulties in mathematics are not fluent in such facts" (Gersten et al., 2009, p. 37). The goal then is to provide the practice, repetition, and multiple iterations with math facts until they become natural reflexive actions during mental math performances.

Part II: ALL ABOUT THE CURRENT THINKING ON TEACHING MATH FACT FLUENCY

Updates to the focus on math fact fluency and its critical place in students' mathematics success cycle include three concerns worth noting: (1) our challenge of the screen-age, the overdependence of students on handheld digital devices that have calculators with their own version of automaticity; (2) although not entirely new, the concept of a *blended model* for teaching math fact fluency, with math computational fluency; and (3) incorporating the latest research findings on the new science of developing expertise that involve personalized, *deliberate practice* protocols focused on engineered routines (reach and repeat iterations, motivating prompts, and coaching feedback to move to future action).

Calculator Dependence

The lack of automaticity with math facts is disturbing, but what is contributing to the number of students who are not reaching automaticity? The popularity and dependence on the calculator could be a major factor. Students who have access to a calculator become dependent on this device. What motivation does a student have then?

"Blended Model" of Teaching Math Fact Fluency and Computational Fluency

Principles and Standards for School Mathematics states, "Computational fluency refers to having efficient and accurate methods for computing. Students exhibit computational fluency when they demonstrate *flexibility* in the computational methods they choose, *understand* and can explain these methods, and produce accurate answers *efficiently*. The computational methods that a student uses should be based on mathematical ideas that the student understands well, including the structure of the base-ten number system, properties of multiplication and division, and number relationships" (p. 152). What a wonderful description of fluency! It reminds us that a student cannot be fluent without conceptual understanding and flexible thinking (Gojak, 2012).

While research shows that knowledge of math facts is important, Boaler (2015) said the best way for students to know math facts is by using them regularly and developing understanding of numerical relations. Boaler further states, "Memorization, speed, and test pressure can be damaging. Hoelscher (2016) says "It is also clear that the most effective intervention strategy for math fact fluency is a blended approach of strategy-based instruction to increase conceptual understanding along with repeated timed practice to develop automatic recall of basic facts."

Automaticity in math facts has been of considerable interest to special educators for decades. A review of the intervention literature suggests at least two common approaches to developing automaticity in facts. One is grounded in the use of strategies for teaching facts, the other emphasizes the use of timed practice drills. Recent research indicates that students might benefit from an integration of these two approaches. This experimental study contrasted an integrated approach (i.e., strategies and timed practice drills) with

timed practice drills only for teaching multiplication facts. Participants were 58 fourth-grade students with a range of academic abilities. Fifteen of the students in the study had IEPs in math. Results indicated that both approaches were effective in helping students achieve automaticity in multiplication facts. However, students in the integrated approach generally performed better on post-test and maintenance test measures that assessed the application of facts to extended facts and approximation tasks. These results have implications for teaching a range of skills and concepts that are considered important to overall mathematical competence in the elementary grades (Woodward, 2016).

The New Science of Deliberate Practice for Developing Expertise

BlueStreak Math Fact Fluency: See It! Hear It! Say It! Type It! Solve It! is personalized and adaptive math fact lessons for addition, subtraction, multiplication, division, and equations using *deliberate* practice rounds balanced by recovery game rounds.

Deliberate practice extrapolated from *Unlocking Student Talent: The New Science of Developing Expertise Practice* offers an unusual commentary that actually and gently, contradicts much of what we know about motivation, practice, and coaching. Practice, as we know it, has morphed into a highly engineered skill, not that similar to the skill and drill we have learned, practiced, and dreaded over the years. In this emerging picture, practice has specifically described protocols (Ericsson & Pool, 2016).

Advocates for Math Fact Fluency

Advancing the explicit teaching skill of math fact fluency, its critical role in more abstract mathematics, is often cited as the compelling reason for its priority placement in the math curriculum. Among organizations supporting this principle, are:

- Common Core State Standards
- The National Council of Teachers of Mathematics
- National Mathematics Advisory Panel
- What Works Clearing House
- TEKS (Texas Educational Knowledge and Skills) (approved new elementary mathematics standards specifically requiring automaticity)
- The *NCTM's Curriculum Focal Points* (fact recall one of the three focal points, grade 2)
- National Mathematics Advisory Panel's Core Principles of Mathematics Instruction (automaticity with mathematical facts)
- *What Works Clearinghouse* (Response To Intervention (RTI) research-based recommendations for programs for struggling students in mathematics include 10 minutes per session for developing fluent retrieval)

PART III: ALL ABOUT BLUESTREAK MATH FACT FLUENCY

BlueStreak Math

What exactly is BlueStreak Math?

BlueStreak Math is an invigorating software solution that assists students with key aspects of *math fact fluency*. It's important to note that *math fact fluency* is not something that happens all at once in a single grade. Along the way, across the grades, active attention for continuous, repetitive practice is required for students to know and be able to perform these skills with proficiency. As stated earlier, it is similar to the expansion of sight words as students develop greater abilities in reading fluency. It is cumulative and long term with continuous use in computational fluency. Yet, occasional brief refreshers recommended as needed throughout grades 5–9 to strengthen the *myelin coating of the axons*. That's the brain science that creates the superhighways needed for continued automaticity.

This web-based solution ensures that sufficient practice and extra support are provided at each grade to allow all students to meet the standards for fluency in particular math areas. In fact, BlueStreak Math is not only a highly effective digital tool, it is also amazingly engaging for students motivated by the design. BlueStreak Math is a just released, cutting edge, digital tool that invites, excites, and ignites student practice, learning, and mastery of math fact fluency.

The name, itself, BlueStreak Math symbolizes the split-second speed, accuracy, and continued automaticity that *math fact fluency* entails for functional mastery. This evokes an image of lightning-like speed and illumination that motivates and inspires. It has that same allure for youngsters as fast cars, roller coasters, and rockets ascending at record speed. After all, BlueStreak Math was specifically designed for kids and to be played by kids again and again.

What does BlueStreak Math look like?

BlueStreak Math is a PreK–8, standards-based content that encompasses addition, subtraction, multiplication, and division facts and equations using all four functions of math from 0–12. This app is designed with specific content for PreK–3, early literacy students, as well as for regular and second chance readers in grades 4–9. Students are on a one-to-one application working on their own, at their own pace, with adaptive progressions to match and/or provide an adaptive challenge for their ability level. BlueStreak Math elements include:

- Pre- and post-test for 0–6, 7–12, and the missing equation in addition, subtraction, multiplication, and division to identify which strategies and related facts the students need to develop for their personalized learning path
- Strategy Cards to teach new math strategies
- Learning Cards to learn and practice new facts in a multimodal learning environment
- Three Single Player Game Themes called Moon Walker, Space Racer, and Earth Defender
- One Multiplayer Game called JetPack Party
- Extended Practice Application
- Chart of Detailed Report for Administrators, Teachers, Parents, and Students
- Certificates for Mastered Facts

Students begin with a pre-test, one designed for facts 0–6, the other for facts 7–12. These determine their level and adapt to the area of weakness, from not knowing the facts to knowing the facts, but demonstrating a certain deficiency area in fluency. Students then are placed in a game-based setting, given a Strategy Card and a related Learning Card for two facts they don't know and begin their game sprints. Each sprint consists of new learning cards along with mastered facts for game-based practice. Students earn BlueStreaks for their longest streak and getting facts accurate and fluent while practicing.

What are the new and exciting BlueStreak Math enhancement features for 2019?

The following updates enhance BlueStreak Math for our tech-savvy youngsters and our 21st Century teaching staff. Features added to the new editions include:

- Spanish and English editions activated with toggle
- Multiplayer Competitive Games (classroom, school, district, and Internet reach)
- Multiplayer Cooperative Projects (classroom, school, district, and Internet reach)
- Student Store (Point Accumulation Incentive, Personalize Character Accessories [Helmet, Stripes, Body Type, Decal, Smiley)
- Heat Map Players (What's Done? What's Left?)
- Leader Board (Class Standings)
- Strategy Log (Reinforcement for Strategies)
- Daily Timeline of Student Progress for Goal Setting for Multi- Tiered System of Supports and Response to Intervention

Enhancement Protocol

BlueStreak Math follows the protocol of expectations for digital software to be continually upgrading to improve, improvise, and innovate the latest and greatest adaptations. This continual tinkering is needed in order to maintain and sustain player motivation for a new personal best.

Improvements

Of course, include the newly released Spanish version of BlueStreak Math, the dual focus on competition and collaboration, 4 levels of explicit strategy cards, the heat map for individual data updates, and goal setting.

Improvising

Textbooks are sometimes preferred or occasionally required with software adoptions to support the differentiated teaching and learning environment. To that end, BlueStreak Math has developed workbooks with student strategy logs for hands-on reinforcement and personal reflections to anchor long-term learning. The workbooks are an available option for districts.

Innovations

Innovations include the point system, frequently used for motivational incentives, accessories for personalizing ownership, incentives to keep playing, and new games to spark curiosity and continued interest.

How does BlueStreak Math assess student progress?

Assessment is key when working on math fact fluency or computational fluency. BlueStreak Math provides initial assessments to determine which facts the students know with automaticity and accuracy. This provides actionable feedback that is used to adjust the ongoing facts presented to each student. Students are provided an adaptive individualized learning path based upon their areas of strength and weakness— the basis for the beginning of a systematic method of assessing and addressing students' fact fluency. Mastered facts are interspersed while new facts are introduced and practiced providing confidence to the students as they are learning their new facts through engaging game-based formats. A post-test will assess the students' growth in each fact fluency areas of addition, subtraction, multiplication, and division.

Scoring is based on the pre-test of 24 questions, accommodated with an adaptive assignment on learning cards for the hierarchy of skills. On the post-test performance, using a new set of 24 questions, students are expected to answer accurately with 100% fluency within 4 minutes. If they can't perform at the level of proficiency, they are presented the learning cards that they did not master and get an opportunity to practice again until mastery with learning cards, gaming sprints and off-line strategy logs.

Why is BlueStreak Math a superior product?

The vision of the BlueStreak founder and creator goes beyond the immediate goal of improving math fact fluency skills for our students. It is one of changing the landscape for continuous practice, known as skill and drill into the inspiring larger vision that drives the BlueStreak Math team. BlueStreak Math crafts the best practice, repetition, and rehearsal solution out there for our students:

- a web-based online product for math fluency,
- commits to continuous improvement and innovations,
- has 24/7 "anytime, anywhere" student accessibility,
- provides a systematic process of mastering facts,
- demonstrates a *hierarchy of skills for developmental growth,*
- Is based on *adaptive one-to-one math fact fluency progressions,*
- addresses *required skills* with engaged learning and strategy cards
- features *multiple games* that allow students variety in practice,
- presents *immediate feedback* about student mastery of facts,
- gives *continuous feedback progress to parents, administrators, and students*
- provides *pre- and post-test data to assess* students and to differentiate
- issues actionable feedback in *easy-to-read charts and graphs,*
- teaches fact fluency to allow time for more complex problem solving, and
- introduces new workbooks coordinated to web platform material.

Why start with BlueStreak Math?

The pedagogical sequence for learning math fact fluency is sound, practical, tried and true. BlueStreak Math is a robust, multi-sensory approach that *differentiates, engages, and reinforces learning* by stimulating a number of senses. It is similar to a known process in reading fluency called, the *Neurological Impress Method* (Heckelman, 1966). It impresses the auditory and visual lobes of the brain as well as the motor cortex in the parietal lobe where the integration of the senses occur when speaking aloud. It is a remedial reading method used in reading fluency. Now, it is being applied to math fact fluency with its multi-sensory input process: See It, Say It, Hear It, Type It, Solve It. This sequence creates neurological signals that impress multiple parts of the brain, ensuing backup support to the memory system (Salimpoor, 2016).

What is the Brain-Compatible Multimodal Sensory Impress Method?

See It: Visual component stimulates the *Occipital Lobes* for vital brain imagery

Hear It: Auditory component stimulates the *Temporal Lobes* for hearing the sound of language

Say It: Vocal component activates the motor cortex in the *Parietal Lobe* and the hearing in the *Temporal Lobe* by the sound of the student's own voice as she or he says the words aloud.

Type It: Bodily/Kinesthetic components activate the integration of the senses in the Motor Cortex located in the *Parietal Lobe*, creating powerful and lasting muscle memory

Solve It: Thinking and reflecting awaken the critical *Frontal Lobes* of the brain to perform the executive functions of cognition that include analyzing, evaluating, perceiving, comprehending, and connecting

Why Stay with BlueStreak Math?

BlueStreak Math is an elastic program that expands as students' progress. It taps into the *plasticity* of the brain, meaning it has the ability to change the students' brain chemistry and its structure as its protocols stretch beyond the immediacy of drill and skill exercises. In addition, BlueStreak Math offers challenges to students with multiplayer platforms that reach beyond the classroom and literally wherever the Internet goes. The contests determine the fastest and most accurate in challenge rounds that invigorate and motivate students to persevere and stick with it until mastery and beyond.

Why revisit, review, refresh, and renew with BlueStreak Math?

The same enticements that get students to start, also gets them to stay such as a web-based online product; quick-win reviews for 2nd chance learners; 24/7 anytime and anywhere unlimited student accessibility and continuing records; multiple games that allow students to practice their facts in fresh environments; proficiency challenges, competitions, and collaborative tasks across states; navigation familiarity and comfort with the BlueStreak Math applications; and finally, step-by-step success to build confidence, collaboration, and communication skills.

BLUESTREAK MATH ALIGNMENTS

How is BlueStreak Math aligned with Common Core and most state Standards?

BlueStreak Math supports Common Core State Standards (CCSS) by addressing the fluency expectations on the 2016 Common Core State Standards Initiative website.
Subsequently, CCSS were re-versioned in similar substance and fashion in most state- generated standards. However, the states that made additions to their new state standards range from handwriting and spelling standards, to cultural sensitivity and social/emotional standards, with little or no attention to the math standards.

Grade	Standard	Required Fluency
K	K.OA.A.5	Add and subtract within five
1	1.OA.C.6	Add and subtract within 20, demonstrating fluency for addition and subtraction within 10.
2	2.OA.B.2	Fluently add and subtract within 20 using mental strategies. By end of Grade 2, know from memory all sums of two one-digit numbers.
3	3.NBT.2 3.OA.7	Students fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction. Students fluently multiply and divide within 100. By the end of Grade 3, they know all products of two one-digit numbers from memory. *Note:* Students must begin work with multiplication and division (3.OA) at or near the very start of the year to allow time for understanding and fluency to develop.
4	4.NBT.B.4	Students fluently add and subtract multi-digit whole numbers
5	5.NBT.B.5	Students fluently multiply multi-digit whole numbers

How is BlueStreak Math aligned with PARCC?

Model Content Frameworks, Mathematics Grade 3–11, Version 4.0 December 2014 https://parcc.pearson.com

How is BlueStreak Math aligned with Smarter Balance?

Throughout the K–6 standards in Common Core State Standards for Mathematics (CCSSM) there are also individual content standards that set expectations for fluency in computation (e.g., fluent multiplication and division within the times tables in Grade 3). Such standards are culminations of progressions of learning, often spanning several grades, involving conceptual understanding, thoughtful practice, and extra support where necessary. Technology may offer the promise of assessing fluency more thoughtfully than has been done in the past. This, too, is part of "measuring the full range of the standards" in a computer adaptive environment to adjust the level of scaffolding that is provided depending on the student's performance level. Computer administration of the assessment affords the possibility of assessing student fluency with mathematical operations by means of monitoring the response time (http://www.smarterbalanced.org).

How does BlueStreak Math extend math fluency skills into life skills?

Sharing the metacognitive "why" with students is a necessary component of math understanding and reasoning abilities. Explaining that mental math will not only serve students well in school but, more importantly, that students will use these skills outside of the classroom in real-world situations. Students must know that mastering mental math helps them when they visit the corner store and need to tally how much the bag of potato chips or candy bar they grabbed from the shelves will cost before they walk up to the register.

As they mature, mental math will help students calculate the price of sale items, know how big of a tip to leave, or how to split a bill when a large party dines out. They will be able to estimate the amount of paint needed for their bedroom walls, the yardage of fabric needed for a puppet theater, and even how to estimate the cost of the family vacation. Estimating costs of store items, distances to destinations, the weight of suitcases, and many other estimations in daily life rely heavily on a keen use of mental math skills.

Again, sharing with students the everyday, practical uses of mental math impresses on them *why* they need to master these simple combinations. Just knowing that they *will* use them, often motivates them to take math fact fluency more seriously. Studies have shown that students are more interested in learning techniques that they can apply to real-world situations, and thus, have more incentive to want to learn them. Here is a brief listing of BlueStreak Math benefits for life skills:

- Gain a level of awareness *above and beyond the immediate subject matter*.
- Connect the subject matter to bigger contextual frameworks
- Think about the tasks and contexts for different learning situations
- Understand themselves as learners in these different contexts
- Increase their abilities to transfer learning to new related and unrelated tasks
- Adapt their learning to new contexts that may be remote from the original
- Know about the different kinds of strategies for learning
- Will be more likely to use strategies for analyzing and problem solving
- Develop a full awareness of the "why and how" of the learning target
- Assume more self-control and management over their own thinking and learning

Why BlueStreak Math Fact Fluency App is Cutting Edge and Brain-Friendly

The BlueStreak Math platform design adheres to the latest brain science that replaces the t*raditional skill and drill method.* The neurological findings about the role of myelin (Ericsson and Pool, 2016) to actually build super highways by coating the axons, the part of the neurons that send messages to the brain, are positively impacted. The wrapping of myelin develops with the deliberate practice routines of practice, coaching, and motivation. This is how the speed and accuracy of mental math and instant memory are nurtured.

- **Practice Reps:** Deliberate practice reps are engineered with multiple iterations, finely honed adjustments to produce continued, well-designed and highly personal progressions

***BlueStreak Math . . . Programmed with Adaptive Progressions for Math Facts Fluency**

- **Practice Resistance:** Resistance and results refer to working at the edge of one's ability and skill level. it's about practicing what one does not do well, with extreme concentration and guidance with accurate and actionable feedback.

***BlueStreak Math . . . Ability to Regulate Level/Speed of Facts Practice/Game Round**

- **Practice Results:** are necessary and eagerly sought because of the intensity of this kind of deliberate, highly monitored practice, often performed in slow-motion, with coaching feedback and attention on the form and the function to detect whether or not the intended results are evidenced as expected.

***BlueStreak Math . . . Immediate Results with Scoring Facts & Games with Digital Records**

- **Practice Recovery:** Recovery, instead of "more is better," is the protocol in deliberate practice. The intensity that accompanies carefully engineered iterations must be followed with a recovery period. While the practices are deliberately brief, the recovery benefits are needed.

***BlueStreak Math . . . Intense, Personalized Fact Practice, Recovery with Adaptive Digital Games**

- **Practice Residual:** Residuals are the mental models that develop in the brain as the myelin continually wraps around the axon of the neurons, creating a "superhighway" of strength and speed for automaticity. That's how the learner continues to find the "math fact" in the blink of an eye.

***BlueStreak Math . . . Myelin Neurological Development with Use, Strengthened with Time**

- **Practice Reach and Repeat:** The practice of "deliberate practice," personally programed and constantly monitored, embraces this effective routine called "reach and repeat". The stretching, reaching, and effort is to surpass the previous record, motivated and determined to "create a personal best" attitude with each attempt

***BlueStreak Math . . . Reach & Repeat for next level, compelling in digital gaming format**

***Excerpts: Unlocking Student Talent: The New Science of Developing Expertise, Fogarty, Kerns, & Pete (2018) and RFA PD Titled: Personalizing Learning: The Voice & Choice, Motivation, Practice & Coaching Challenge.**

PART IV: ALL ABOUT BLUESTREAK MATH WORKBOOKS AND STRATEGY LOGS

- **Guided Math Instruction.** The Strategy Log Workbook provides strategy pages, step-by-step problem solving, and key vocabulary. It is used for guided math instruction individually or in small groups.

- **Independent Practice.** The Independent Work Pages follows a Strategy Page for students to demonstrate fact understanding as they apply their learning. Learning Card lessons in Strategic Log are introduced, explained, applied, and independently practiced.

- **Student Journal Page.** The journal page is for students to record their thoughts and progress. Also, by describing their strategies, it helps concretize that understanding for long-term memory

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