Welcome!

John Marshall Parent University
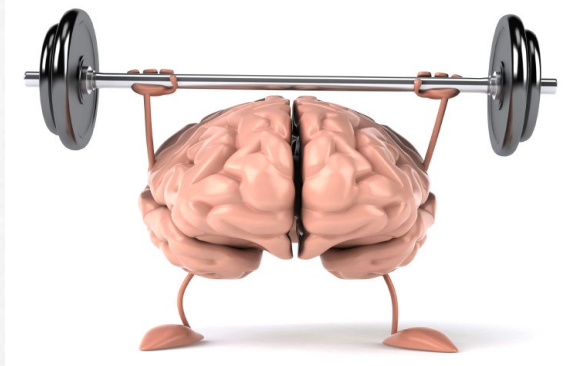
Math Fact Fluency & Principal's Challenge

Feel free to contact me at:
kathleen.gluchowski@edison.k12.nj.us

" The human mind has a limited capacity to process information, and if too much energy goes into figuring out what 9 + 8 equals, little is left over to understand the concepts underlying multi-digit subtraction, long division, or complex multiplication.

"

When Working Memory is overloaded- Learning STOPS!!!

Students need automatic recall of some facts in order to solve problems.

Common Core/NJSLS Expectations K-2

- Kindergarten Fluently add and subtract within 5
- Grade 1 -Add and subtract within 20, demonstrating fluency for addition and subtraction within 10.
- Grade 1- Given a two-digit number, mentally find 10 more or 10 less than the number, without having to count; explain the reasoning used.
- **By end of Grade 2, know from memory all sums of two one-digit numbers**
- Grade 2-Mentally add 10 or 100 to a given number 100–900, and mentally subtract 10 or 100 from a given number 100–900.

Common Core/NJSLS Expectations 3-5

- 3rd Grade –Fluently multiply and divide within 100 using strategies such as the relationship between multiplication and division (e.g., knowing that 8x5=40, one knows 40/5=8 or properties of operations.
- **By the end of grade 3, they know all products of two one-digit numbers from memory.**
- 3rd Grade – 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.
- Grade 4 – Students fluently add and subtract multi-digit whole numbers using the standard algorithm.
- Grade 5– Students fluently multiply multi-digit whole numbers using the standard algorithm.

Fluency & Automaticity Concepts

- Focus is on the 4 basic operations
  with single digit facts
- Other Number Sense Concepts
  - Rounding
  - Comparing Numbers
- Fractions
  - Equivalent Fractions
  - Comparing Fractions
  - Simplifying Fractions

Research

- Math fact fluency is the ability to **<u>accurately</u>** and <u>quickly</u> recall basic addition, subtraction, multiplication, and division facts

  (Burns, 2005; McCallum, Skinner, & Turner, 2006; Poncy, Skinner, & Jaspers, 2006).

- Students who possess **<u>fluency</u>** can recall facts with <u>automaticity,</u> which means they typically think <u>no longer than two seconds</u> before responding with the correct answer.

Research from National Math Panel

- Conceptual understanding, computational and procedural fluency, and problem solving skills are equally important and mutually reinforce each other. Debates regarding the relative importance of each of these components of mathematics are misguided.

- Students should develop immediate recall of arithmetic facts to free the "working memory" for solving more complex problems.

(National Math Panel, 2008)

Learning Progression Stages

- 1. Understanding
  - Manipulatives & Pictorial Representation
- 2. Relationship
  - Making connections within & across operations
- 3. Fluency
  - Strategy development for accuracy
- 4. Automaticity
  - Practice to facilitate automaticity
  - Recall within 3 seconds

Individual Results

My Learning Log for the Principal's Challenge

Date	Challenge Type	Accuracy Score	Automaticity Score	My Next Challenge Will Be	What Does this Mean for me

Student Results - Now What

Thank you for participating in the Principal's Challenge. Here are your results. Please make sure you record them on your Learning Log to track your growth and progress.

Accuracy: 100%
Automaticity: 100.00%

Congratulations!! You have passed this challenge and will move onto the Rounding A Challenge. Please click on the Rounding A link below when it is time for the next challenge.

Thank you for participating in the Principal's Challenge. Here are your results. Please make sure you record them on your Learning Log to track your growth and progress.

Accuracy: 100%
Automaticity: 63.00%

Based on your Automaticity score you will move to the Addition A challenge. Please click the link for the Addition A challenge below when it is time for the next challenge.

Student Results - Now What

Thank you for participating in the Principal's Challenge. Here are your results. Please make sure you record them on your Learning Log to track your growth and progress.

Accuracy: 98%
Automaticity: 85.00%

Based on your Automaticity score you will move to the Addition A challenge. Please click the link for the Addition A challenge below when it is time for the next challenge.

Thank you for participating in the Principal's Challenge. Here are your results. Please make sure you record them on your Learning Log to track your growth and progress.

Accuracy: 94%
Automaticity: 49.00%

Based on your Automaticity score you will move to the Addition A challenge. Please click the link for the Addition A challenge below when it is time for the next challenge.

Student Results - Now What

Thank you for participating in the Principal's Challenge. Here are your results. Please make sure you record them on your Learning Log to track your growth and progress.

Accuracy: 64%
Automaticity: 7.00%

Based on your Automaticity score you will move to the Addition A challenge. Please click the link for the Addition A challenge below when it is time for the next challenge.

Thank you for participating in the Principal's Challenge. Here are your results. Please make sure you record them on your Learning Log to track your growth and progress.

Accuracy: 80%
Automaticity: 32.00%

Based on your Automaticity score you will move to the Addition A challenge. Please click the link for the Addition A challenge below when it is time for the next challenge.
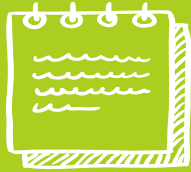
Math Fact Practice at Home

Planned

- Practice Daily:
  - 5 mins
- Variety
  - Different Activities
  - Flashcards
  - Sorts
  - Oral Practice
  - Online
- Materials Set-Up
- Preview
  - Websites
  - Apps

Purposeful

Know the Goal
Activities for 4 Stages
- Understanding
- Relationship
- Fluency
- Automaticity

Targeted

Productive Practice
- What is Known
- What is unknown
- What facts are
  - fluent?
  - automatic?
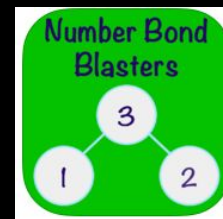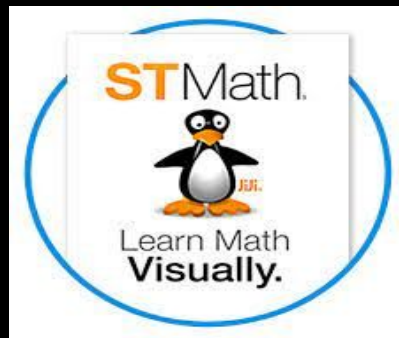- Limit # of facts
  - 8 facts max

Math Log

- Weekly goal
  - 50 minutes
- Practice types
  - Relationship
  - Accuracy
  - Automaticity
  - Vocabulary
- Online
  - websites/apps
- Paper Pencil
  - Drill Sheets
- Flashcards
  - Regular-Triangle
- Math Certificate

Principal's Challenge

- More challenges
  - Operations broken down
  - Fluency with Number Sense
  - Added Decimals
- Accuracy Score
- Overall Score
- Student Learning Logs

Review the Process