MATH FLUENCY FRAMEWORK

ESSENTIAL ELEMENTS

1 Understand

Research Framework

- 4 Elements of Fluency
- Cycle of Engagement
- Automaticity
- Practice
- Math Talk
- Modeling Mathematical Thinking
- Students Engagement

Shared Definitions

- School Administrators
- Teachers
- Students
- Parents
- Other Stakeholders (school staff & larger community)
- Mission Statement
- Vision Statement

2 Assess

Get the Data
(build fluency profile)

- 4 Elements of Fluency
- Looking at individuals, classes, grades, grade bands and school trends
- Math Running Records
- Conferring
- Standardized Tests

Use the Data

- Make an Individual Fluency Plan
- Student Goal Setting
- Make Acceleration Plans
- Map out Daily Fluency Routines
- Plan Family Math Fluency Days & Nights

3 Prepare

Classroom Design

- Differentiated Fluency Workstations
- Fluency Anchor Charts (Class)
  - Strategy
  - Models
  - Learning Target/ Success Criteria
- Classroom Library (section on fluency books)

Materials

- Fact Fluency Folders
- Fact Fluency Rings
- Fluency Progressions
- Strategy Anchor Charts
- Model Anchor Charts
- Goal Setting
- Progress Monitoring
- Certificates
- Fact Fluency Parent Brochures/Newsletters by Grade
- Fact Fluency Videos by Operation
- Fact Fluency Website

Student-created strategy cards

Core set of manipulatives/ tools (domino, dice, 2 sided counters, cubes, highlighters, colored pencils, different types of paper (grid, centimeter, blank), rulers, number paths, beaded number lines, number lines and hundred grids).

- Plan Family Math Fluency Days & Nights

4 Teach

Instruction

- Daily Routines- Whole Group
- Workstations - Individual, Partners, Small Group
- Guided Math Groups
- Personalized Goal Setting
- Homework

Assessment
(Ongoing)

- Math Running Records
- Entrance/Exit Slips
- Observations
- Anecdotals
- Interviews
- Conferring
- Student Reflection

5 Reflect/Revise

Analyze the Data
(weekly, monthly, quarterly)

- Individually
- Class
- Grade
- Grade Band
- School

Interpret the Trends and Adjust Instruction Accordingly

- Individually
- Class
- Grade
- Grade Band
- School

1 Research Framework

	Beginning	Approaching	Meeting	Exceeding
1.1 4 Elements of Fluency ● Accuracy - Knowing the correct answer and being able to reason out and explain why it is correct ● Efficiency - Given the numbers, understanding ways to get an answer in a "reasonable amount of time" (Bay-Williams & SanGiovanni, 2021) ● Flexibility - Being able to think about a problem in a variety of ways ● Appropriate Strategy Selection - Being able to look at numbers and reason about which strategies to use based in properties, place value and the relationship between the operations (NCTM, 2000)				
1.2 Cycle of Engagement ● Concrete - Using concrete materials ● Pictorial - Using pictorial materials ● Abstract - Using symbols and numerals				
1.3 Automaticity ● Result of fluency ● "Instant popping into of mind" (Logan) ● Getting an answer within three seconds and/or reasonable amount of time without getting bogged down or "stuck."				
1.4 Practice ● Students should understand different strategies ● Students should practice using each of those strategies ● Students should practice selecting between the strategies ● Should be meaningful, intentional, purposeful, based on the progression of the operation (Baroody, 2006; Van de Walle, 2007; Henry & Brown, 2008; Boaler, 2015; Bay Williams & SanGiovanni, 2021)				
1.5 Math Talk ● Students should be explaining their thinking ● Students should be naming their strategies ● Students should have a common language for the strategies they are using across grades ● Students and Teachers should be posing purposeful questions ● Students should be listening to, understanding and critiquing the thinking and reasoning of others (Baroody, 2006; Van de Walle, 2007; Boaler, 2015; Bay Williams & SanGiovanni, 2021)				
1.6 Modeling Mathematical Thinking ● Represent their thinking with pictures, numbers and words ● Choose and use tools appropriately ● Represent thinking by acting out, using concrete materials, sketches and diagrams (CCSSM, 2010) (NCTM, 2000)				
1.7 5 Students Engagement ● Students reflect on their work ● Students revise their work ● Students set goals ● Students make action plans for improving ● Teachers encourage and motivate students through positive, informative, feedback ● Teachers promote a growth mindset (Cskikzentmihalyi, 1997; Guskey, 1997; Black & Wiliam, 1998; Dweck, 2006; Marzano, 2007)				

2 Shared Definitions

	Beginning	Approaching	Meeting	Exceeding
School Administrators There is a fluency action plan made at the district, school and grade levels.There are designated people with checkpoints along the implementation path.				
Teachers All teachers have been trained in the elements of the fluency plan. All teachers understand the implementation plan and the teaching components.				
Students All students understand the fluency pathway and have a way to self-track and monitor their progress with individual fluency folders.				
Parents All parents understand the fluency pathway and have a way to help their students practice at home and monitor their progress. Parent Fluency Workshops should be a part of the implementation plan.				
Other Stakeholders (school staff & larger community) Everybody should understand the general plan.				
Mission Statement (Does your school have one?) Watch the video. Create a Mission Statement.				
Vision Statement (Does your school have one?) Watch the video. Create a Mission Statement.				

3 Get the Data - (build fluency profile)

Looking at individual, class, grade, grade band, school trends

	Beginning	Approaching	Meeting	Exceeding
Math Running Records (Do you do these?)				
Conferring (Do you do this?)				
Standardized Tests (What overall trends does this data tell you?)				

4 Use the Data

	Beginning	Approaching	Meeting	Exceeding
Make an Individual Fluency Plan				
Student Goal Setting (Do you currently do this?)				
Make Acceleration Plans (Do you currently do this?)				
Map Out Daily Fluency Routines (Do you currently do this?)				
Plan Family Math Fluency Days & Nights (Do you currently do these?)				

5 Classroom Design

	Beginning	Approaching	Meeting	Exceeding
Differentiated Fluency Workstations (Do you have these?)				
Fluency Anchor Charts (Class) (Do you have all of these?)				
• Strategy (What you are doing with numbers)				
• Models (How you are showing your thinking)				
• Learning Target/Success Criteria (What you are teaching and what it looks like when students learn it)				
Classroom Library (section on fluency books) (Do you have picture books that focus specifically on fluency?)				

6 Materials

	Beginning	Approaching	Meeting	Exceeding
Fact Fluency Folders (Do students have these?)				
Fact Fluency Parent Brochures/Newsletters by Grade (Do you have this?)				
Fact Fluency Videos by Operation (Do you have this?)				
Fact Fluency Website (Do you have this?)				
Student-created strategy cards (Do you have this?)				
Fact Fluency Social Media (Do you have a twitter, pinterest, facebook or school blog that discusses math fact fluency?)				
Core set of manipulatives (Do you have these?) • domino, dice, 2 sided counters, cubes or snap cubes, highlighter, colored pencils, different types of paper (grid, centimeter, blank), rulers, number paths, beaded number lines, number lines and hundred grids.				

7 Instruction

	Beginning	Approaching	Meeting	Exceeding
Daily Routines- Whole Group (What does this look like?)				
Workstations (How are these structured?)				
• Individual				
• Partner				
• Small Group				
Guided Math Groups (Do you sometimes focus on math fluency?)				
Personalized Goal Setting (Do your students do this?)				
Homework (How do you integrate work on math fact fluency throughout the year?)				

8 Assessment
(Ongoing)(Which of these do you do?)

	Beginning	Approaching	Meeting	Exceeding
Math Running Records				
Entrance/Exit Slips				
Observations				
Anecdotals				
Interviews				
Conferring				
Student Reflections				

9 Analyze the Data
What is your plan? (weekly, monthly, quarterly)

	Beginning	Approaching	Meeting	Exceeding
Individually				
Class				
Grade				
Grade Band				
School				

10 Interpret the Trends and Adjust Instruction Accordingly

(How are you keeping track of this information?)

	Beginning	Approaching	Meeting	Exceeding
Individually				
Class				
Grade				
Grade Band				
School				