



## Targeted Math Instruction Plan Exceptional Student Learning Support Division Broward County Public Schools



### **What does the research say about current math achievement?**

- 25% to 35% of students struggle with mathematics knowledge and application skills in general education classrooms, indicating the presence of mathematics difficulty (Mazzocco, 2007)
- 5% to 8% of all school-age students have such significant deficits that impact their ability to solve computation and/or application problems that they require special education services (Geary, 2004)
- Most students fail to meet minimal mathematics proficiency standards by the end of their formal schooling (U.S. Department of Education, 2003).

### **Why have a targeted instruction plan specifically for Mathematics?**

- In the absence of intensive instruction and intervention, students with mathematics difficulties and disabilities lag significantly behind their peers (Jitendra et al., 2013; Sayeski & Paulsen, 2010)
- Early mathematics intervention can repair deficits and prevent future deficits (Clements & Sarama, 2007; Fuchs, Fuchs, & Karns, 2001; Fuchs, Fuchs, Yazdian, & Powell, 2002; Griffin & Case, 1997; Sophian, 2004).
- Math is highly proceduralized and continually builds on previous knowledge for successful learning. Hence, early deficits have enduring and devastating effects on later learning, as indicated in The Head Start Path to Positive Child Outcomes (U.S. Department of Health and Human Services, 2001) and elsewhere (e.g., National Mathematics Advisory Panel, 2008; National Council of Teachers of Mathematics [NCTM], 2000; U.S. Department of Education, 2003).

## What are the characteristics of students with learning difficulties in mathematics?

Students who struggle with mathematics learning regardless of their motivation, past instruction, and mathematical knowledge prior to starting school:

- demonstrate slow or inaccurate recall of basic arithmetic facts;
- answer problems impulsively, without inhibition;
- have difficulty representing mathematical concepts mentally;
- have poorly developed number sense; and
- have difficulty keeping information in their working memory.

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### **Focus Skill Hierarchy**

*Three General Levels of Math Skill Development (Kroesbergen & Van Luit, 2003)*

As students move from lower to higher grades, they move through levels of acquisition of math skills, to include:

- Number sense
- Basic math operations (i.e., addition, subtraction, multiplication, division)
- Problem-solving skills: “The solution of both verbal and nonverbal problems through the application of previously acquired information” (Kroesbergen & Van Luit, 2003, p. 98)



#### **1. Number Sense**

The characteristics of good number sense include:

- a) Fluency in estimating and judging magnitude
- b) Ability to recognize unreasonable results
- c) Flexibility when mentally computing
- d) Ability to move among different representations and to use the most appropriate representation. (Kalchman, Moss and Case 2001)

“ ... the ability to understand the meaning of numbers and define different relationships among numbers. Children with number sense can recognize the relative size of numbers use referents for relative size of numbers, use referents for measuring objects and events, and think and work with numbers in a flexible manner that treats numbers as a sensible system.” (Clarke & Shinn, 2004)

In a recent study of 180 seventh-graders conducted by the University of Missouri, researchers found that, “those who lagged behind their peers in a test of core math skills needed to function as adults were the same kids who had the least number sense or fluency way back when they started first grade.” (Neergaard, 2013)

## **2. Computation (Basic Math Operations)**

NCTM Principle and Standards of School Mathematics (2000) define computational fluency as having efficient, flexible and accurate methods for computing.

- Efficient - the ability to choose an appropriate, expedient strategy (and/or algorithm) for a computation
- Flexible - the ability to use number relationships with ease in computation
- Accuracy - the ability to produce a correct answer

Calculation is also in the definition of Specific Learning Disability from IDEA.

*Specific learning disability* means a disorder in one or more of the basic psychological processes involved in understanding or in using language, spoken or written, that may manifest itself in the imperfect ability to listen, think, speak, read, write, spell, or **to do mathematical calculations**, including conditions such as perceptual disabilities, brain injury, minimal brain dysfunction, dyslexia, and developmental aphasia. (IDEA, 2004)

## **3. Problem Solving**

Limitations in word problem solving ability reduce confidence for mathematics and affect learner performance on informal classroom evaluations as well as on standardized state assessments (Jordan, Hanich, & Kaplan, 2002). Students need to be competent problem solvers to meet the regimen of educational standards and most importantly to demonstrate proficiency in using mathematics to solve real life problems (Wilson & Sindelar, 1991). Students are less likely to persevere on problems that are irrelevant or uninteresting (Murphy & Ross, 1990).

**Interventions must be:**

- Teacher Directed  
Computer only programs do not count as interventions. Teachers must be directly instructing students in small groups using an intervention program or evidence-based strategy.
- Progress Monitored Regularly  
The skill being remediated must be assessed regularly in order to collect adequate data on the intervention/strategy (likely weekly). Chapter tests are not progress monitoring assessments as they test more than just the remediated skill. Curriculum-based measures that are aligned to the skill and/or embedded progress monitoring within and intervention program are acceptable options.
- Implemented with Fidelity per Recommended Implementation Guidelines  
Intervention programs are only proven to be effective when implemented per the guidelines from the publisher. The program was researched under those conditions (frequency and duration) and they must be replicated to get similar successful results.

**Scheduling of Implementation**

See *Sample Elementary Schedule* below.

Targeted Mathematics Instruction can occur during a scheduled intervention block (during the Interdisciplinary Block) or in small group during the core Math Block (60 minutes).

Time	Scheduled Activity	Time
8:00 am - 8:05 am	Transition (5 minutes)	5
8:05 am - 9:35 am	90-Minute Reading Block (Science and Social Studies Content Embedded)	120
9:35 am - 10:05 am	30 minutes Writing	
10:05 am - 10:35 am	Physical Activity (30 minutes)	30
10:35 am - 11:35 am	Science/Social Studies (60 minutes)/Interventions	60
11:35 am- 11:40 am	Transition (5 minutes)	5
11:40 am - 12:10 pm	Lunch (30 minutes)	30
12:10 pm - 1:10 pm	Math (60 minutes)	60
1:10 pm -1:30 pm	Recess (20 minutes)	20
1:30 pm - 2:00 pm	Specials (30 minutes)	30
	<b>Total</b>	<b>360</b>

Red = State Statute Mandate

## **MTSS Problem-Solving Steps**

The problem-solving process integrated in this workshop comes from Florida's multi-tiered system of supports (MTSS). MTSS continues to provide high-quality instruction and intervention matched to student needs through the implementation of the problem-solving response to instruction/intervention framework. Students who are eligible for exceptional student education are part of MTSS in their school. Four problem-solving steps are used. <http://florida-rti.org/gtips/>

1. Define the problem by determining the difference between what is expected and what is occurring. Ask, "What specifically do we want students to know and be able to do when compared to what they currently know and are able to do?" When engaged in problem solving at the individual student level, the team should strive for accuracy by asking, "What exactly is the problem?"
  - Review General and Special Considerations
  - Screen students to determine if there is a deficit in Mathematics using:
    - Number Knowledge Test (free, individually administered)
    - Go Math Prerequisite Test (adopted material, group administered)
    - Mathematics Diagnostic Assessments
2. Analyze the problem using data to determine why the issue is occurring. Ask, "Why is/are the desired goal(s) not occurring? What are the barriers to the student(s) doing and knowing what is expected?"
  - Use Targeted Instruction Placement Chart to determine focus skill of intervention (Number Sense, Computation and/or Problem Solving).
  - The IEP team determines the student's present level of academic achievement and functional performance and establishes annual goals.
3. Develop and implement a plan driven by the results of the team's problem analysis by developing an intervention plan to achieve the goal. Ask, "What are we going to do?"
  - The IEP team identifies the specific special education services and supports that the student needs.
  - Choose intervention or evidence-based strategy from Recommended Interventions Chart that addresses the focus skill.
  - Implement according to implementation guidelines.

- Progress monitor the focus skill regularly using:
  - Curriculum Based Measures (CBM) in Number Sense
  - Curriculum Based Measures (CBM) in Computation
  - Program embedded progress monitoring
  - Problem Solving Assessments/Rubric that test the evidence-based strategy in use
  - Some options are available here: [https://padlet.com/naomi\\_church/pmmath](https://padlet.com/naomi_church/pmmath)

4. Measure response to instruction/interventions by using data gathered from progress monitoring at agreed-upon intervals to evaluate the effectiveness of the intervention plan based on the student's response to the intervention. *Progress monitoring data should directly reflect the targeted skill(s).* Ask, "Is it working? If not, how will the instruction/intervention plan be adjusted to better support the student's or group of students' progress?"

This problem-solving process is applied before, during, and after the determination of eligibility for ESE. It does not end when a student is placed into ESE (DQIEP, pp. 5–8).

For more information, see: Guiding Tools for Instructional Problem Solving (GTIPS). (2015). Tallahassee, FL: Florida Department of Education. [http://www.floridartl.usf.edu/resources/topic/overview\\_of\\_rti/GTIPS-R\\_Print/index.html](http://www.floridartl.usf.edu/resources/topic/overview_of_rti/GTIPS-R_Print/index.html)

For additional information on Mathematics Intervention Programs in Broward County Public Schools, please contact Naomi Church, FDLRS Program Specialist at the Exceptional Student Learning Support Division. 754-321-3400 or [naomi.Church@browardschools.com](mailto:naomi.Church@browardschools.com)



## Targeted Instruction Placement Chart



Score on Number Knowledge Test (NKT)	Focus Skill Placement
Chronological Age (CA) Equivalent Score on NKT below student's actual Chronological Age	Number Sense
Chronological Age (CA) Equivalent Score on NKT at or above student's actual CA <b>and</b> In Grades 1-3 <b>and</b> Below 80% on Addition and/or Subtraction (Computation) Screener	Addition and/or Subtraction
Chronological Age (CA) Equivalent Score on NKT at or above student's actual CA <b>and</b> in Grades 4-5 <b>and</b> Below 80% on Multiplication and/or Division (Computation) Screener	Multiplication and/or Division
Chronological Age (CA) Equivalent Score on NKT at or above student's actual CA <b>and</b> Score at or above 80% on ALL computation screeners	Problem Solving intervention or evidence-based strategy

**Interventions must be:**

1. *Teacher Directed*
2. *Progress Monitored regularly (likely weekly)*
3. *Implemented with fidelity per Recommended Implementation Guidelines.*

### Number Knowledge Test Comparison Chart

Raw Score	Developmental Level Score	Chronological Age (CA) Equivalents	Grade Level (GL) Equivalents
1-3	-0.5	2-3 years	Preschool
4-6	0.0	3-4 years	Preschool
7-8	0.5	4-5 years	PreK-K
9-14	1.0	5-6 years	K-1
15-19	1.5	6-7 years	1-2
20-25	2.0	7-8 years	2-3
26-28	2.5	8-9 years	3-4
29-30	3.0	9-10 years	4-5