FROM IDENTIFICATION TO INTERVENTION:
SUPPORTING STUDENTS WITH A MATH LD OR DYSCALCULIA

REGION 2 CORPUS CHRISTI 6/3/2026

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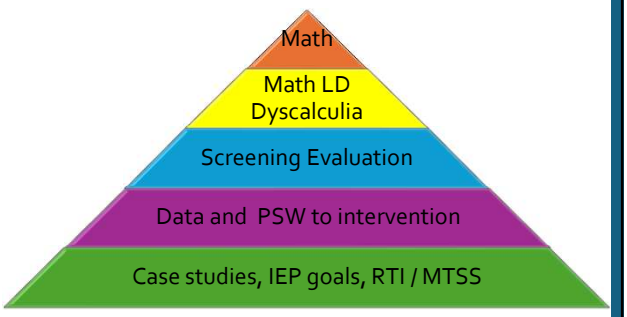

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The Burden of Low Numeracy in Adulthood

Mental health: 22% of 18–24-year-olds have math related issues

Drop out: Students with MathLD have higher drop out rates, GED is difficult

Need basic numeracy time management, all jobs use log-ins, time charts, data files, inventory lists, health charts, etc.

Poor math skills directly impact financial literacy, job opportunities, overall economic stability

MathLD may lead to predatory loans and difficulty tracking wages or managing debt/mortgages.

Estimated to cost $300 billion annually in lost productivity, errors, and reliance on government assistance

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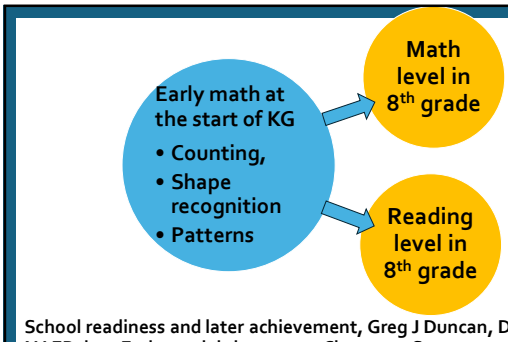

School readiness and later achievement, Greg J Duncan, Dev Psych, 2007
NAEP data Early math is important Clements, Sarama 2013

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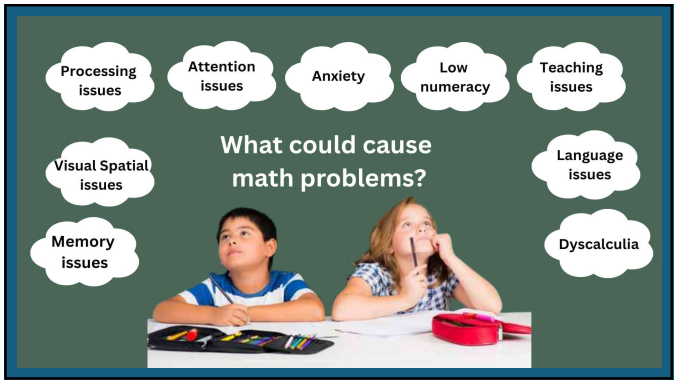

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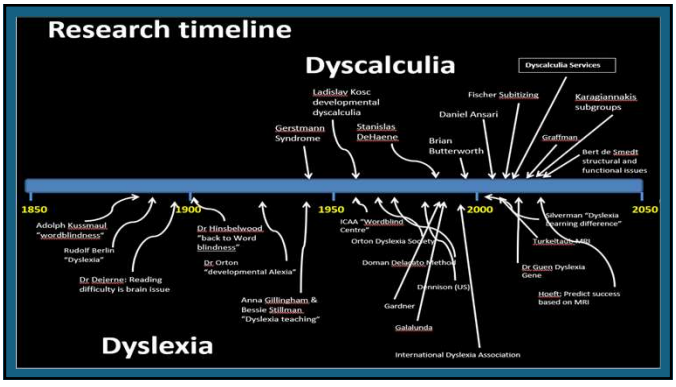

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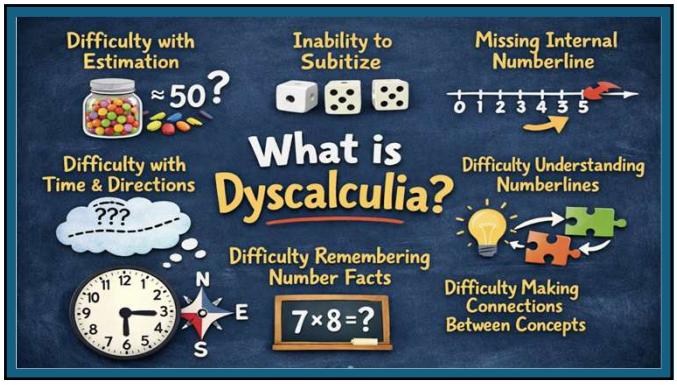
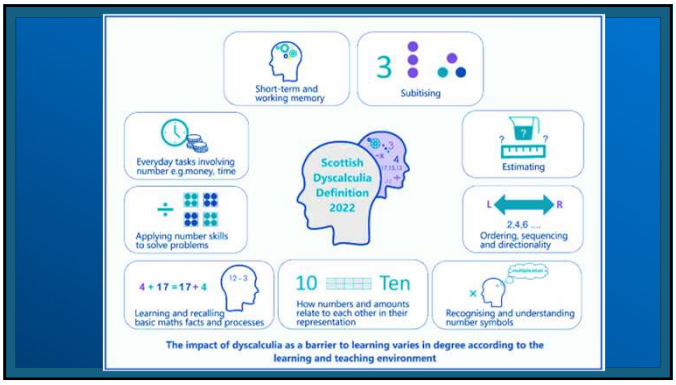
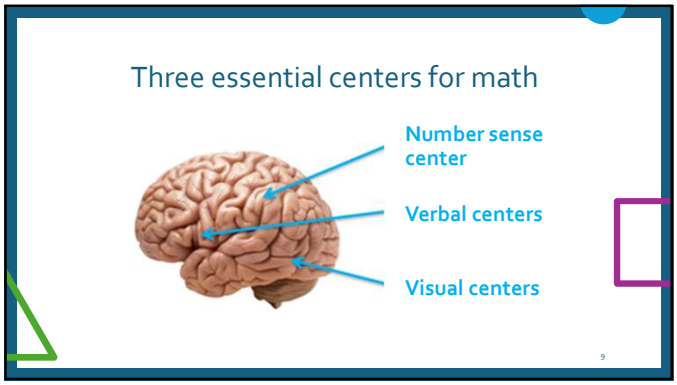

Difficulty with Estimation
≈50?
Inability to Subitize
Missing Internal Numberline
0 1 2 3 4 5
What is Dyscalculia?
Difficulty with Time & Directions
???
Difficulty Understanding Numberlines
Difficulty Remembering Number Facts
7×8=?
Difficulty Making Connections Between Concepts
N
E
S

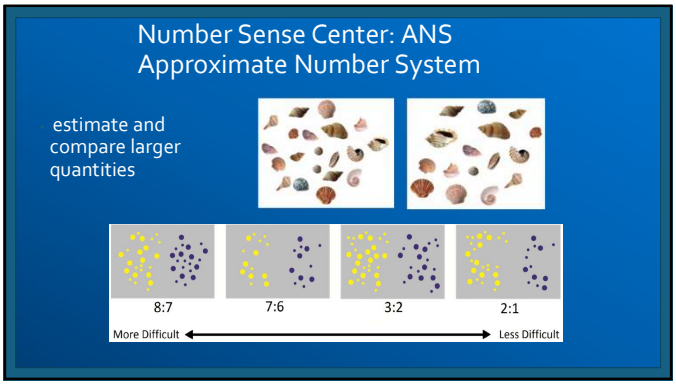
7


Short-term and working memory
3
Subitising
Everyday tasks involving number e.g.money, time
Scottish Dyscalculia Definition 2022
Estimating
Applying number skills to solve problems
Ordering, sequencing and directionality
4 + 17 = 17 + 4
Learning and recalling basic maths facts and processes
10 Ten
How numbers and amounts relate to each other in their representation
Recognising and understanding number symbols
The impact of dyscalculia as a barrier to learning varies in degree according to the learning and teaching environment

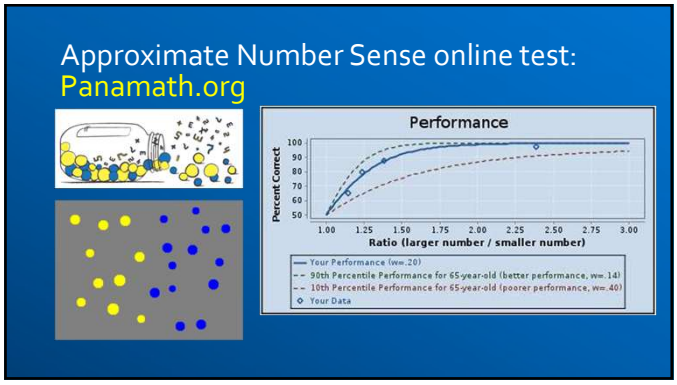
8


Three essential centers for math
Number sense center
Verbal centers
Visual centers

9


Number Sense Center: ANS
Approximate Number System
estimate and compare larger quantities
8:7
7:6
3:2
2:1
More Difficult
Less Difficult

10


Approximate Number Sense online test:
Panamath.org
Performance
Percent Correct
Ratio (larger number / smaller number)
Your Performance (w=.20)
90th Percentile Performance for 65-year-old (better performance, w=.14)
10th Percentile Performance for 65-year-old (poorer performance, w=.40)
Your Data

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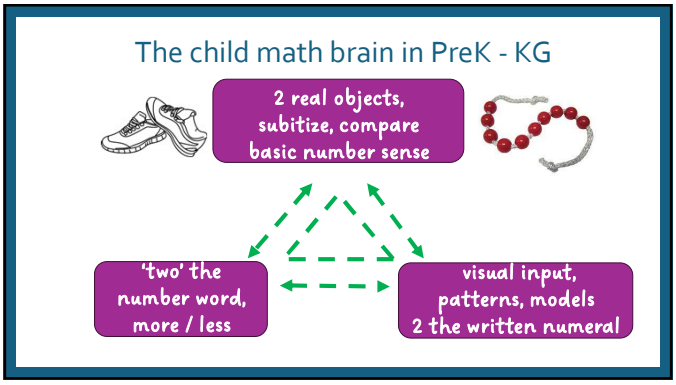
The child math brain in PreK - KG
2 real objects, subitize, compare basic number sense
'two' the number word, more / less
visual input, patterns, models 2 the written numeral

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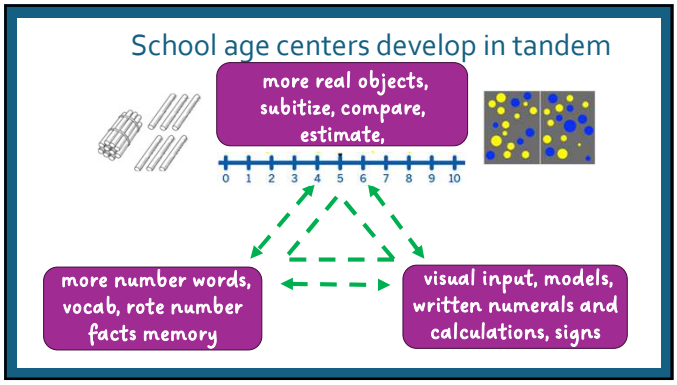

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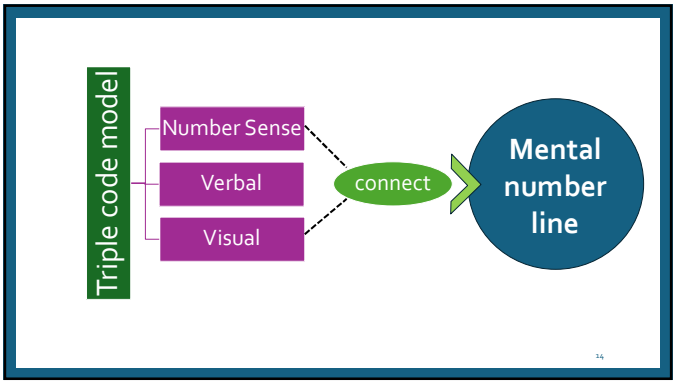

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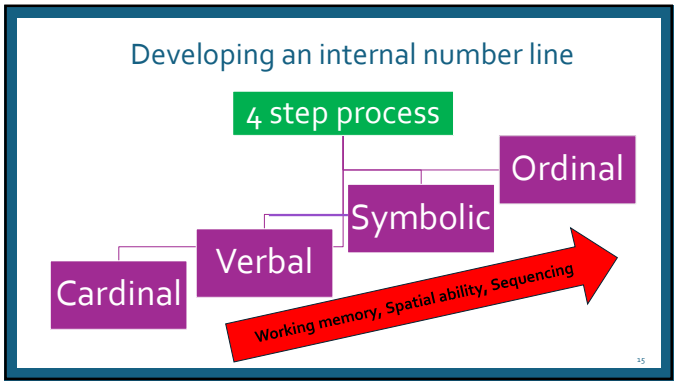

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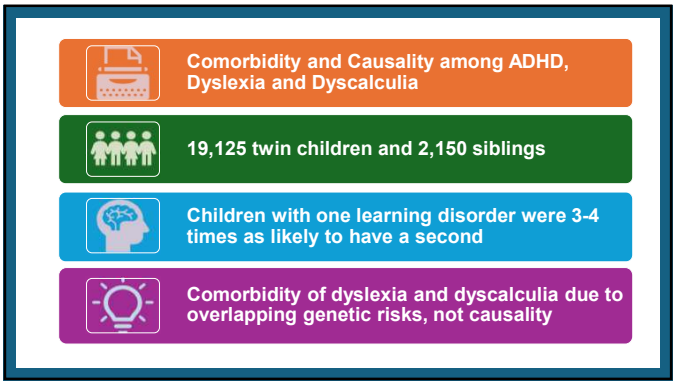

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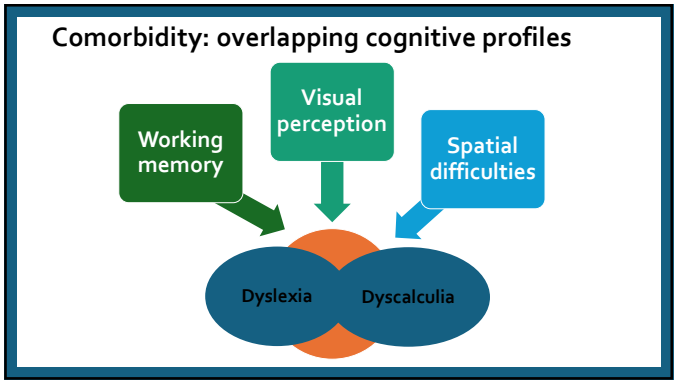

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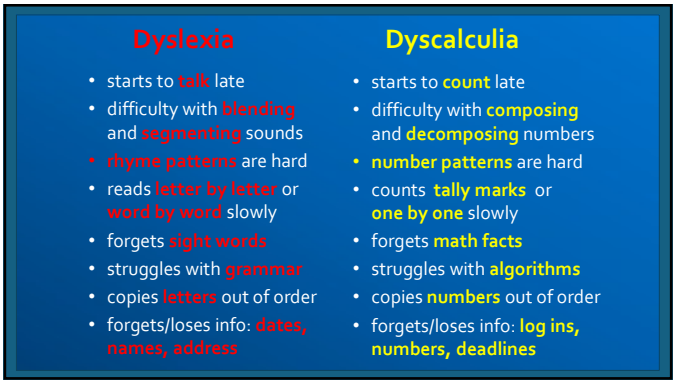

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Language	Math
Phoneme: individual sounds	**Unit of counting**: dots, beads, etc.
Phonemic awareness: awareness of sounds within words	**Part-Whole awareness**: smaller numbers exist within a number
Phonological awareness: knowledge and sensitivity to phonological structure of words (rhyme, syllable count, first, middle, and ending sound)	**Number Sense**: knowledge and sensitivity of the structure of numbers, more/less, part-whole, grouping, place value
Phonics letter-sound association: teaching reading and spelling using sound-symbol connection	**Written numeral - number word - quantity association:** teaching connection of real quantities with number words and numerals

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Language assessment	Math
Decoding sound out a word using letter-sound connection, digraphs, syllables structures	**Decoding** numerals using the triple code and place value groups as 'syllables'
Sight words like in the Dolch list, some need to be memorized, some can be derived	**Math facts** can be memorized, many can be derived using the number structure
Spelling as encoding	**Writing a quantity** as encoding
Sentence writing verbal content to convey meaning	**Calculations** number sentences to convey quantitative meaning
Comprehension from learning to read to reading to learn and make sense of a text	**Problem Solving**: apply number knowledge and structure to make sense of a word question

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Math LD and dyscalculia diagnosis gap

The Language Barrier ELL

Math struggles can be misinterpreted as language hurdles.

Misattributing Struggles

- Seemingly inattentive mistakes mask misunderstanding
- It is 'just developmental'
- Not trying hard enough, etc.

Diagnostic Overshadowing

- Through comorbidity of dyscalculia, other LDs or ADHD
- Schools can only address one LD at a time

Referral and Identification Delay

- 1st or 2nd grade is deemed 'too early' to assess / diagnose
- Need to fail twice first

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Possible causes of math anxiety

Difficult timed tests and pop quizzes	Being called upon to answer a problem	Working under time pressure
Start new concept before the previous is understood	Tests that cover multiple topics, benchmarks	No visual cues or modeling
Not understand notes and need to do HW.	Abstract, no concrete or representation	Only one algorithm accepted

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Student stress respond behaviors

Fight	Flight	Freeze	Fawn
Aggression	Walk out of class	Blankly staring	Perfectionism
Arguing	Ignore teacher	Dissociating	Overpreparing
Threats	Skip classes	Shrug	Befriending bullies
Yelling	Getting kicked out on purpose	Head on desk	Submit to pressure
Cursing	Headphones	Not answering	Lack boundaries
Refuse to sit at desk	Cellphone surfing	Appear forgetful absent minded	People pleasing
Provoke adults		Avoiding tasks	

Building a Trauma Restorative School, Brummer, 2011

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mAMAS Math Anxiety Score, age 8-13, 9 questions
Emma Carey et al, Frontiers of Psychology 2017, vol. 8

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Early screening in KG – 1st grade

- **Numeracy Screener** free from Numerical. Cognition Lab, CA
  - 2 activities: comparing dots, comparing numbers
  - **Updated version more subtest, norms follow**
- **Kindergarten Math CBM for fluency** Fuchs Research Group, Vanderbilt
  - Dots counting and easy calculations with written numerals
- **Early Numeracy Indicators ENI** free from the RIPM website
  - 4 subtests: read numbers, compare numbers, missing number, mixed
- **Universal Numeracy Screener USNS** free from Forefront Education
- **TEN Test of Early Numeracy** from AimswebPlus
  - 4 subtests: count, read numbers, compare numbers, missing numbers

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Numeracy Screener: www.numeracyscreener.org

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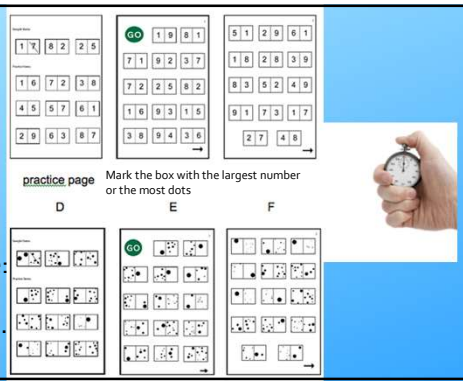
2 sections: dots, numerals

spring KG: 2 min per section,

1st -2nd grade: fall, winter, spring: 1 min. per section



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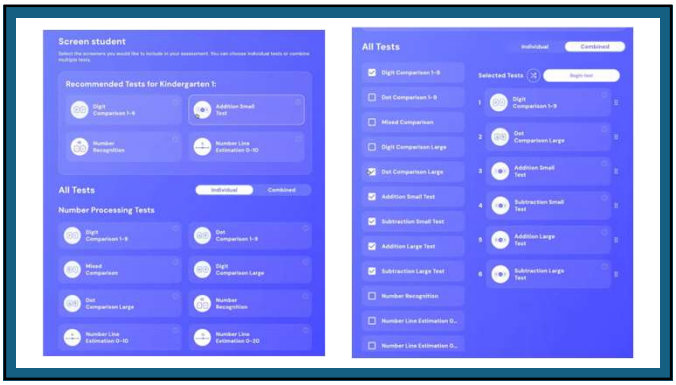

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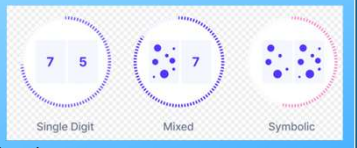
NumeracyScreener.com tutorial
NumeracyScreener.app to do the test online

- Digit comparison (2 levels)
- Dot comparison (2 levels)
- Mixed comparison
- Number recognition
- Number line estimation (2 levels)
- Addition (2 levels)
- Subtraction (2 levels)



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Progress monitoring

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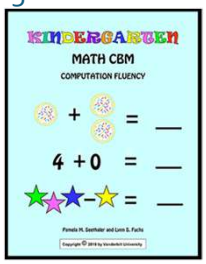
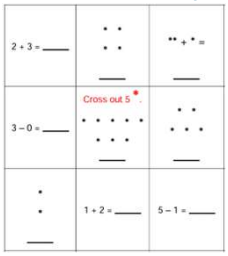
Kindergarten Math Computation Fluency: 5 min





By Seethaler and Fuchs, VanderBilt University

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Early Numeracy Indicators, mixed examples - RIPM Research Institute on Progress Monitoring

5	2	7	1	8	3

0 1 2 ___ | 1 ___ 3 4 | 5 10 15 ___

6	15	1	44

	Fall	Winter	Spring
Date			
Number Identification			
Form 1			
Form 2			
Mean			
Quantity Discrimination			
Form 1			
Form 2			
Mean			
Missing Number			
Form 1			
Form 2			
Mean			
Mixed Numeracy			
Form 1			
Form 2			
Mean			

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Early Numeracy AIMSweb PLUS, 1st grade

MEASURE	TIME	GRADE	FALL	WINTER	SPRING	Prog. Mon.
Number Naming Fluency	1 min.	k	x	x	x	x
Quantity Dots - Total Fluency	1 min.	k	x	x	x	x
- Difference Fluency	1 min.	k		x	x	x
Concepts & Applications: Mental Math	7-12 min.	k, 1	x	x	x	
Number Comparison Fluency	1 min.	1	x	x	x	x
Math Facts Fluency – 1 Digit	1 min.	1	x	x	x	x
– Tens	1 min.	1		x	x	x

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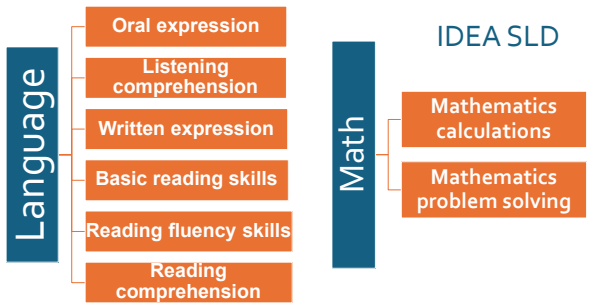
IDEA SLD



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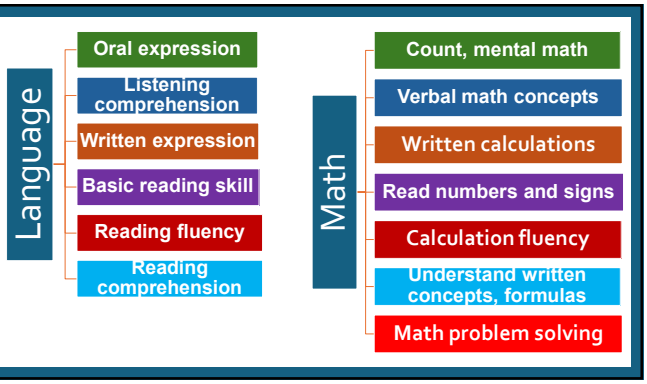

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National Council of Teachers of Mathematics NCTM

Teaching and learning

- Conceptual understanding
- Procedural Fluency
- Strategic competency
- Adaptive reasoning
- Productive disposition

Strands

- Number and Operations
- Algebra and patterns
- Geometry
- Measurement
- Data analysis and probability

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Mathematics calculation

- Counting forward, backward
- Read and write numerals
- Number comparison
- Number patterns
- Understand place value
- Know basic math facts
- Add, subtract, multiply, divide
- Whole numbers, fractions, decimals, powers, roots, etc.
- Use models and number lines
- Algorithms and formulas
- Round, estimate, and check

Mathematics problem solving

- Verbal comprehension
- **Understand the process**: is a quantity added, subtracted, multiplied, split etc.?
- **Multistep questions** require working memory, planning, and sequencing
- **Strategies**: draw a picture, work backwards, act it out, find a pattern, make a table, solve a simpler problem, logical reasoning, use a graph, write a number sentence, guess and check
- **Apply calculations**

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Typical calculation format in achievement tests

6 + 4 =? | 9 – 6 =? | 3 x 5 =? | 20 : 4 =?

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All formats required by the NCTM

6 + 4 =?	9 – 6 =?	3 x 5 =?	20 : 4 =?
6 + ?=10	9 - ? = 3	3 x ?=15	20 : ?=5
? + 4=10	? – 6 = 3	? x 5=15	? : 4 =5

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The LDA published the Specific Learning Disabilities Evaluation Principles and Standards

Resource: Connect the CHC to Intervention Tools

https://ldaamerica.org/the-ld-institute

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LDA: SLD Evaluation Principles and Standards

Inter-disciplinary	Dynamic, iterative	Literacy and numeracy research	Cultural background
Strength based	Professional development	Effective instruction	Focus on improved outcomes

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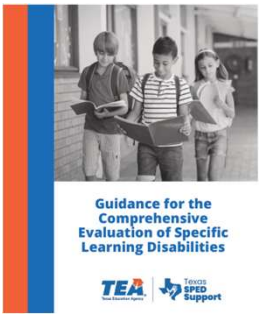

Texas SLD identification

1. Determination by MDT
2. Observation of student's learning in areas of difficulty
3. Documentation of inadequate achievement based on multiple sources
4. Verification of appropriate instruction
5. Examination of exclusionary factors
6. Confirmation of **insufficient progress based on response to scientific research-based intervention OR** a **pattern of strengths and weaknesses**

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TEA eligibility criteria: SLD

DO need a pattern of strengths and weaknesses in performance, achievement, or both

That pattern is relative to age, grade-level standards, or intellectual development

DO NOT need significant variance among specific areas of cognitive functioning or between specific areas of cognitive function and academic achievement

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INFORMAL
- Referral Data
- Records Review
- Vision/Hearing Screening
- Work Samples
- Parent Information/Interview
- Teacher Information/Interview
- Observations - School/Home

CURRICULUM-BASED
- Teacher-made/Textbook Quiz
- District Benchmarks
- Curriculum Based Measurement (CBM)
- Running Records
- Progress Monitoring
- Universal Screeners

CRITERION-REFERENCED
- State of Texas Assessments of Academic Readiness (STAAR®) and STAAR Alternate (ALT) 2
- Universal Screeners
- Iowa Test of Basic Skills (ITBS)
- Brigance Test
- Texas English Language Proficiency Assessment System (TELPAS) and TELPAS ALT
- Advanced Placement (AP) Tests
- Scholastic Aptitude Test (SAT) and American College Test (ACT)

NORM-REFERENCED
- Standardized Measures:
  - Achievement Tests
  - Cognitive Tests
- Developmental Measures
- Specialized Measures

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Achievement data sources

INFORMAL
- Parent information/ interview
- Teacher information/ interview
- Observation
- Student information/ interview
- Work samples - math journals, single-skill calculation tasks, mixed-skill calculation tasks, math fluency tasks

CURRICULUM-BASED
- Teacher-made tests/ quizzes
- Intervention progress monitoring
- CBM – early numeracy, computation (available via Intervention Central)
- Comparison to enrolled grade-level standards
- Mathematics Progress Monitoring Measures

CRITERION-REFERENCED
- Math universal screeners
- District math benchmarks
- STAAR® math assessment

NORM-REFERENCED

Standardized measures of math calculation (timed and untimed)

Standardized measures of word problems (orally presented), graphs/ tables, measurement tasks, time and money concepts

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KG - 1	2 - 3	4 - 6
Counting late	Keeps counting by 1	Still counting, tally marks
Not counting back	Low number sense	Multiplication tables low
Low sequencing	Adds all, not adds-on	Word problems confusing
Part-Part-Whole	Can't memorize add or subtraction facts	Struggles with fractions, decimals, percentages
Subitizing, dice	Number lines are confusing	Can't make a sensible guess, answers are far off
Less interest in ordering, sorting, dice, dominoes, blocks, puzzles, patterns, games	Only place value name, no regrouping skills	Fraction, decimal, percent
	Left-Right, directions	Proportional thinking
	Analog clock is hard	Works slowly, anxiety
		Time, money, direction
		Forget numbers, data, login

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Middle school	High School
Lacks vocab, procedures, concepts	Abstract reasoning deficit
Fractions, decimals, percentages difficulties	Can't relate a concrete situation with algebraic expression
No proportional reasoning	Can't generalize
No connection between representations	Difficulty with the ways two quantities can be connected
Word problems: no reality check if answer 'makes sense', can't estimate	Does not see a patterns
Low organization in general	Can't visualize shapes, tables, and graphs in geometry
Loses dates, deadlines, log ins	Difficulty with the language of math, notations, formulas

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Assessment Name	Provider	Cost/student	Frequency	Length
AMU grades K-2	Educ. NW	free	3	20-30 min.
Fastbridge Math	Renaissance	$8.00	3-5	15-30 min.
i-Ready Diagnostic	Curr. Ass.	$8.00	3	25-60 min.
IXL Math (Not KG)	IXL	$13.25	3	20-30 min.
mClass Math	Amplify	$9.00	3	30 min.
NWEA MAP GROWTH	NWEA	$7.50	3-5	45 min.
AIMSWeb Plus	Pearson	$4.25	3-5	K-1 15 min. 2-12 25-35 min.
Star Math	Renaissance	$5.41	3-5	25-30 min.

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Easy CBM tests: K–8 and Proficient math, free monthly progress with graph: **easycbm.com**

- **K** — Numbers and Operations; Geometry; Measurement
- **1** — Numbers and Operations; Geometry; Measurement and Data
- **2-3** — Numbers and Operations; Geometry; Algebra
- **4-5** — Numbers and Operations; Measurement; Algebra; Data
- **6-8** — Numbers and Operations; Algebra; Geometry/Measurement

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NWEA MAP test: K–12, 45 – 60 min.

K-2
- Operations and Algebra: Solve Problems; Operations, Properties
- Number/Operations: Place Value, Counting, Base Ten, Fractions
- Measurement, Data: Problems Involving Measurement and Data
- Geometry: Reason with Shapes and Their Attributes

2-5
- Operations and Algebra: Solve Problems; Patterns, Relationships
- Number and Operations in Base Ten and with Fractions
- Measurement and Data; Geometric Measurement and Problems
- Geometry: Reason with Shapes, Attributes, & Coordinate Plane

6+
- Ratios and Proportional Relationships
- Expressions and Equations
- Geometry

The Number System
Functions
Statistics and Probability

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Parameters in FIE reports

General ability tests
- Standard Scores and confidence interval
- Percentile ranks (related to SS)
- Significant differences

Achievement Tests
- Standard Scores and confidence interval
- Percentile ranks (related to SS)
- Relative Proficiency Index
- Grade equivalent/Age Equivalent

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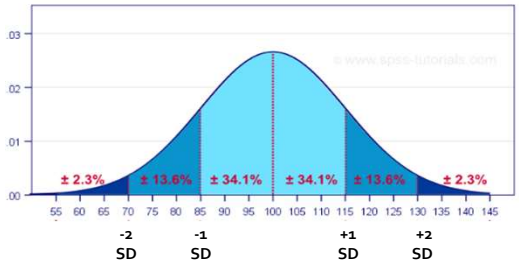
Standard score original graph



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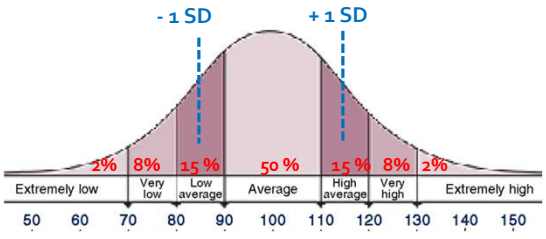
Parameters to report: Standard score



Low average scores can be a real problem due to impact on ability to access the curriculum

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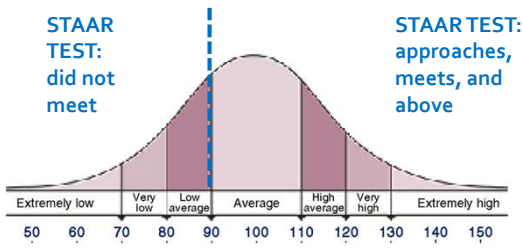
Parameters to report: Standard score

STAAR TEST: did not meet

STAAR TEST: approaches, meets, and above



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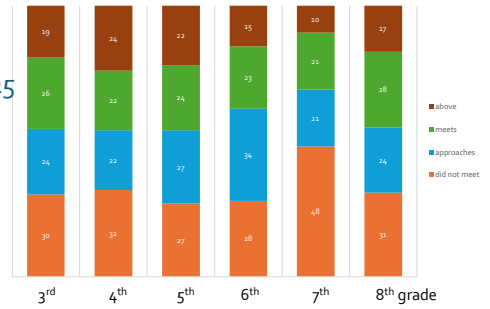
STAAR Math spring 2025 3rd - 8th



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Relative Proficiency Index

- Criterion referenced
- The score the assessed student would get for similar test questions for which an average performing student would score 90
- Common RPI is 82-95

Grade Equivalent

- The earliest grade level at which an average performing student would get this question correct

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Cognitive abilities		Achievement	
CAS-2:	5-18	KTEA-3	preK-12
KABC II-NU	3-18		
TONI-4	6-90		
CTONI-2	6-90		
WISC-5	6-16	WIAT-4	PreK-adults
W-J V COG	5-90	W-J V ACH	5-90
CB-TT	6-90	WRAT-5:	5-85
Panamath	6-90		

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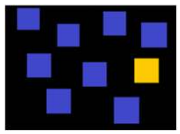
Cognitive abilities		Achievement	
CAS-2:	5-18	KTEA-3	preK-12
KABC II-NU	3-18		
TONI-4	6-90		
CTONI-2	6-90		
WISC-5	6-16	WIAT-4	PreK-adults
W-J V COG	5-90	W-J V ACH	5-90
CB-TT	6-90	WRAT-5:	5-85
Panamath	6-90		

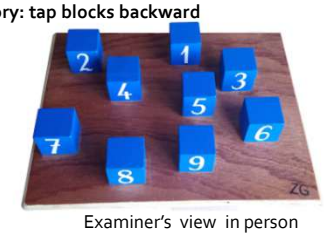
58

Corsi Block-Tapping Test

- Visual spatial short-term memory: repeat tapping forward
- Visual spatial working memory: tap blocks backward



Examinee's view online



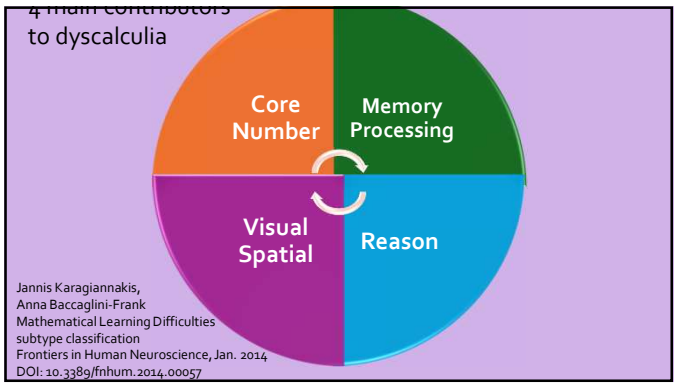
Examiner's view in person

59

◆ Gs with strong links with Math LD

Gc Crystallized intelligence	◆ Gf Fluid reasoning	◆ Gsm Short term memory
◆ Glr Long-term retrieval	◆ Gv Visualization	◆ Gs Perceptual speed
◆ Gq Quantitative knowledge	Glr Naming facility	Ga Auditory processing

60



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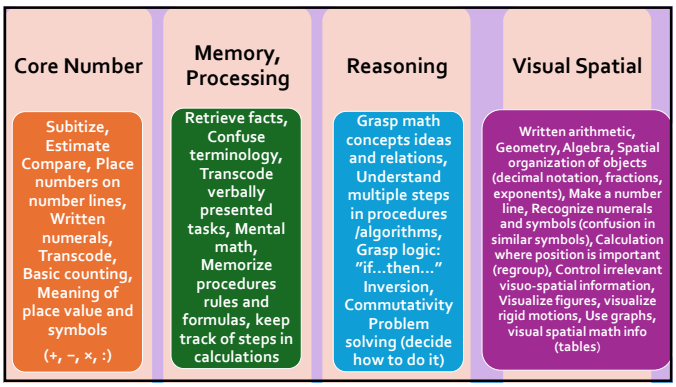

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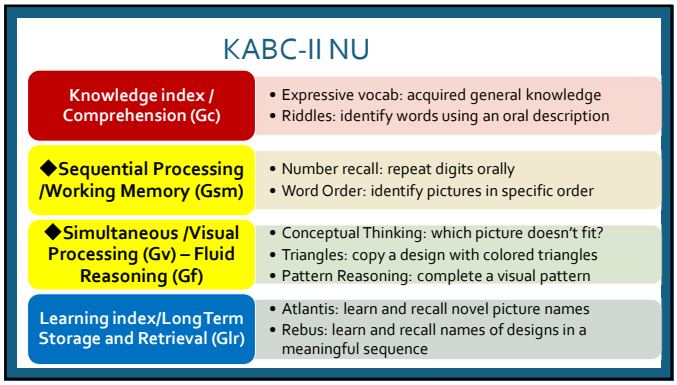

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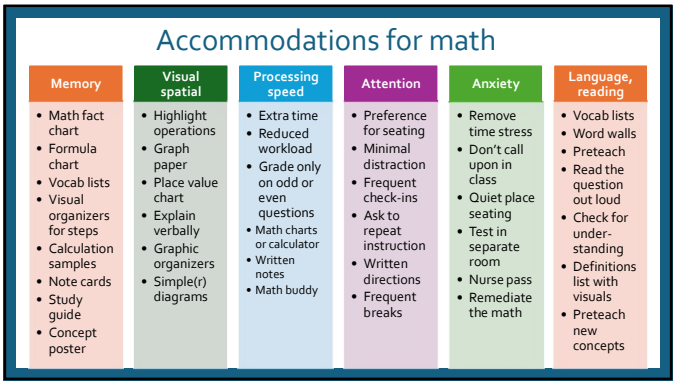

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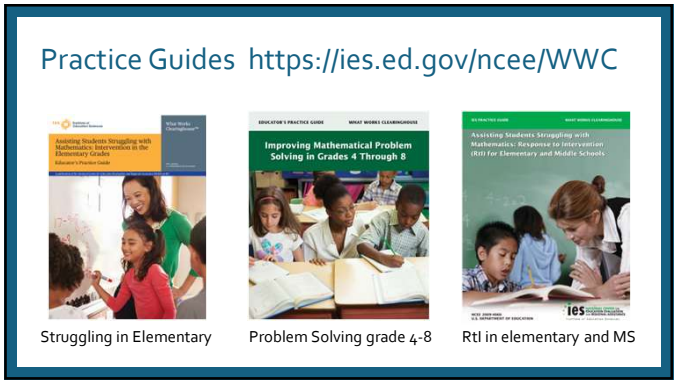

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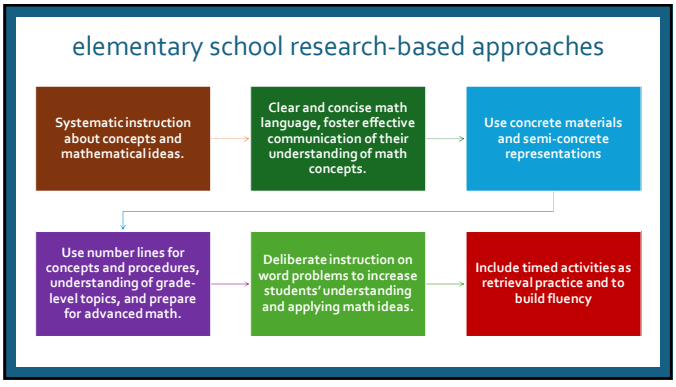


66

Problem solving instruction for grade 4-8

- Prepare both routine and novel problems, appropriate for your students' knowledge. Clarify context or language
- Monitor and reflect on the process: list prompts, model it. Use student thinking to develop students' ability to monitor and reflect.
- Teach making and using visual representations, show examples of problems represented visually and convert them into math notation.
- Demonstrate multiple problem-solving strategies, compare strategies in worked examples and ask students to generate multiple strategies
- Help recognizing and articulating concepts and notations. Explain steps used in a worked example. Help making sense of algebraic notation

67

Dyscalculia remediation in general


Multisensory math instruction (visual, auditory, kinesthetic/tactile)


Math strategies (breaking down problems, use hands-on or visual aids, modeling)


Assistive technology (math software, calculator, graphing software)

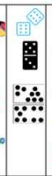
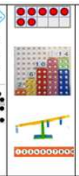
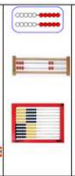

Adapted math materials (fact charts, number lines, graphic organizers, formula sheets)

68

Concrete – Representational - Abstract

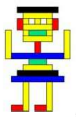
Story context	Objects	Pictures	Abstract
Janet has three dolls and gets another one There are five deer in the forest and two run away	All types of tiles, counters, blocks, shapes, rekenrek Rods, strips, fraction pieces A toy with pizza slices to 'cut' and re-assemble	A family and one more family: Pizza pictures to show fractions Models, schema ten frames, diagrams graphs	Write numerals: on a number line in number sentences to label models as equation or in a formula in number series

69

Topic								
Count/subitize	✓	✓	✓	✓				
Add/subtract	✓	✓	✓	✓	✓			
Multiply		✓	✓	✓	✓			✓
Divide		✓	✓	✓	✓			✓
Fractions					✓	✓	✓	
Decimals						✓	✓	
Proportions						✓	✓	✓
Algebra							✓	✓
Geometry						✓	✓	✓

70

Cuisenaire rods



4+3

8+5

5 + 8 = 13
13 - 8 = 5

9-2

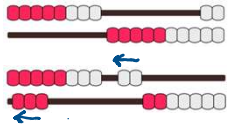
13-7

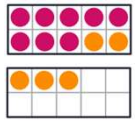
8 x 3 = 24
4 x 6 = 24
6 x 4 = 24

3 x 2 = 6

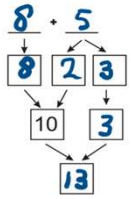
2 x 3 = 6

71





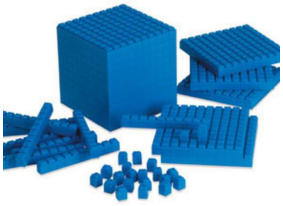
Explicitly connect various tools and representations



72

interlocking base ten blocks

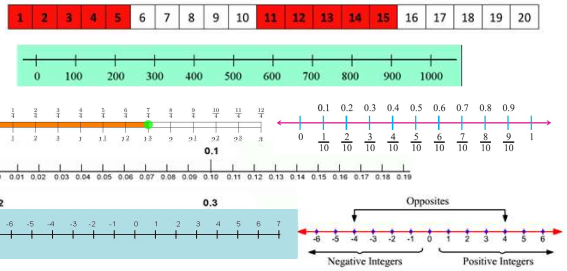
hands-on 'building' like Lego's to regroup, and split up again, instead of changing out material



compatible with with Cuisenaire rods rods

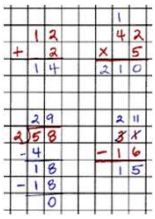
73

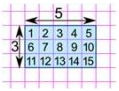
Developing number line concepts



74

Graph paper is indispensable





- One number or sign per square
- Match for handwriting size do2learn.com, printablepaper.net
- Keeps numbers aligned, helps with regrouping, place holder zeros don't get lost, shows concept of place value
- Draw models, rectangles to multiply, area and perimeter, quadrilaterals
- Draw strip models and fraction strips
- Geometry, graphs, functions

75

Word problems: separate first, combine later

Math facts practice → Problem solving

NumberlessWP.com

1.Product? 2. Number of groups? 3. Group size ?

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Sample problem that needs modeling from the Problem Solving grade 4-8 Guide, p.24

- Eva spent 2/5 of her money on a coat and then spent 1/3 of what was left on a sweater.
- Now she has $150 remaining.
- Can you figure out how much money she had to start with?

Next slide how you can demonstrate with free strip models on MathPlayground.com Story problems Thinking Blocks

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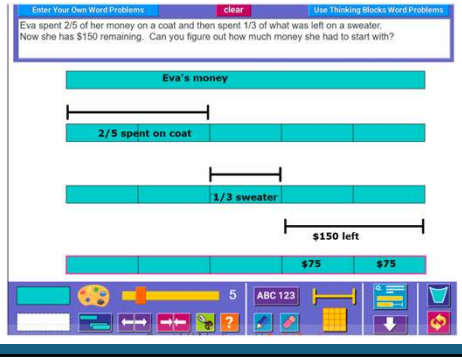

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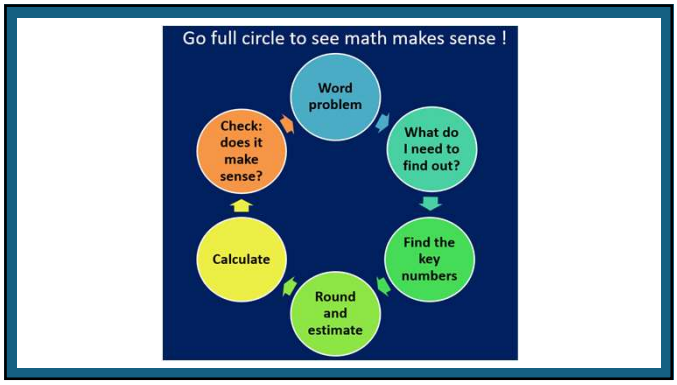

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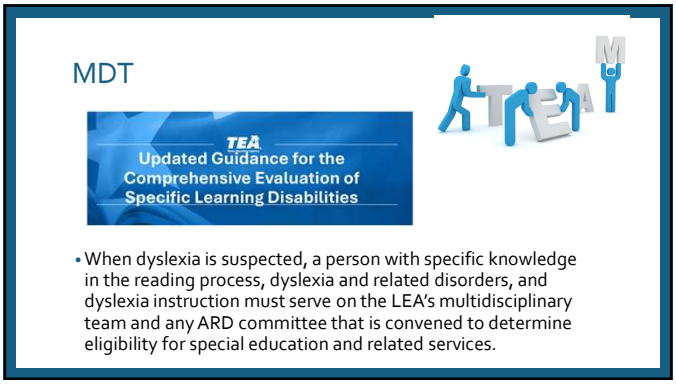

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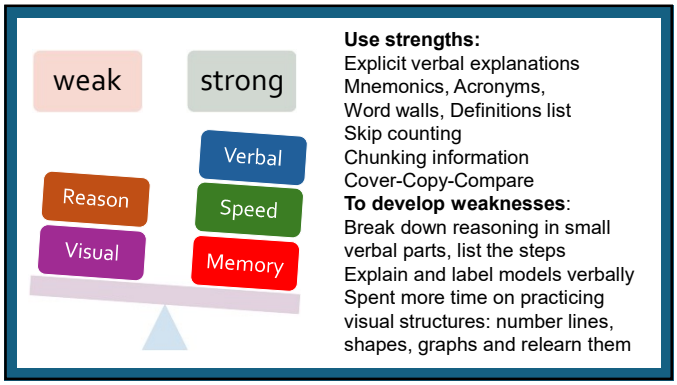

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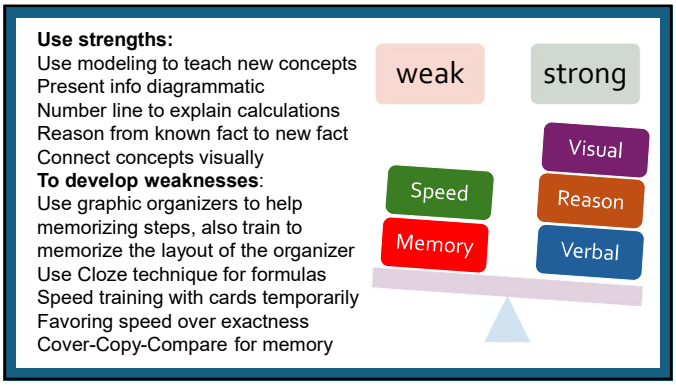

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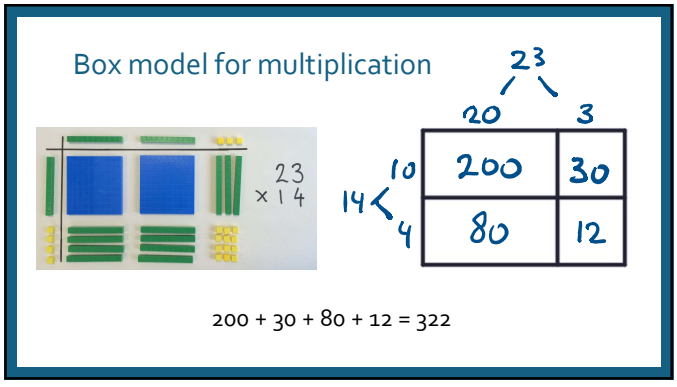

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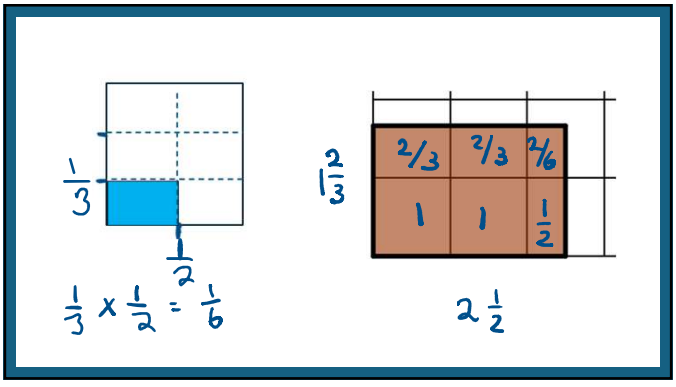

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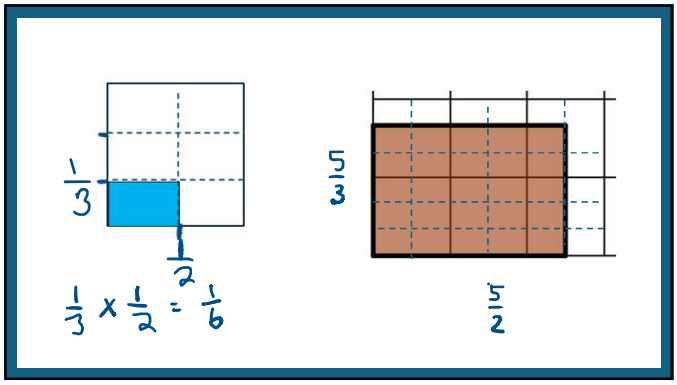

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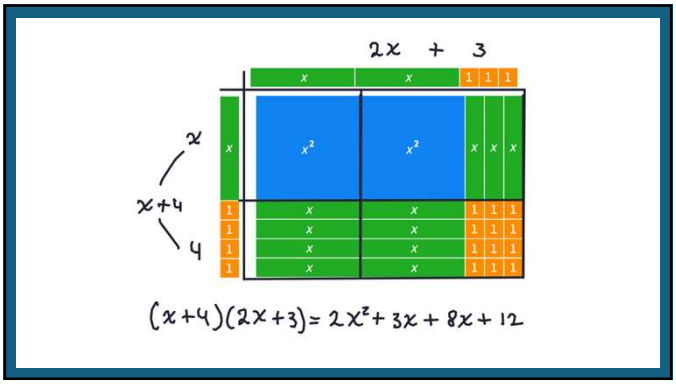

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Remediation programs selection

Program	grades	group	time	cost	Effect size
CTL Whole Number Foundations (Roots)	K-1	2-5	20 min. 50 lessons	$540	+0.18
Bridges intervention, Math Learning Center	K-2 3-5	small group	30 min. 40-65 lessons per volume	$1,100 $1,100	+0.10-0.25
M-STAR 1. Math Facts Multiply and Divide 2. Equivalent fractions 3. Ratios 4. Proportionality	Elem./ MS		30 min. at least or 2-3 day, 12 lessons >30 min. 15 lessons >30 min. 11 lessons >30 min. 17 lessons	free	
EduGAINs Canada GAP Closing	MS,HS	small group	3-10 sections in 7 modules	free	

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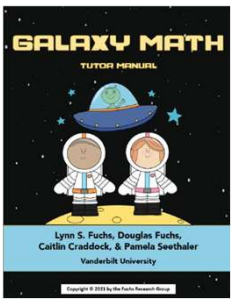
Remediation programs Fuchs Research Group

Program	grades	group	time	cost	Effect size
Galaxy Math	1-3	1-3	3x 30 min. 15 weeks	$75-90	+0.29
Pirate Math individual whole class	1-3 1-3	1-3 class	3x 30 min. 13 weeks	$75-95	+0.37
Math Wise Calculation	2	1-3	2x 45 min. 17 weeks	$130	+0.34
Number Rockets	2-4	1-3	3x 40 min. 17 weeks	$130	+0.34
Fraction Face Off Super Solvers Fraction	4 4-5	2-4	3x 30 min. 12 weeks 45 min. 29 lessons	$130 $125-150	+0.59

88



- Counting on a number line
- Identifying numbers smaller and larger than a given number
- Defining key mathematical terms
- Introducing tools for addition and subtraction
- Utilizing families of numbers for addition and subtraction
- Galaxy Math incorporates a space theme to increase student interest

frg@vanderbilt.edu.

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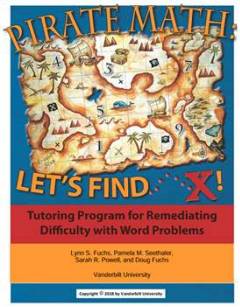

Fully scripted, easy to use, teaching assistant

Proven effective: effect size 0.37

16 weeks, 48 lessons, 25-30 minutes

Includes all instructional materials, instructor provides stopwatch/timer, reinforcers treasure chest

Structure:

2-4 min. math flashcards

2-3 min. warm up, reteaching

15 min. scaffolded instruction

3 min. sorting cards timed practice

5 min. pen and paper problem solving

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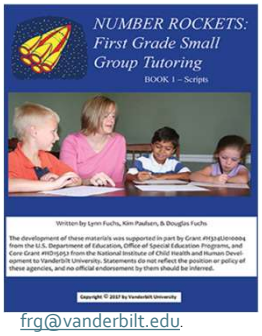

- Identify and write numbers
- Identify more and less objects
- Sequence numbers
- Use <, >, and = signs
- Skip counting by 10s, 5s, and 2s
- Identify place value
- Identify operations
- Write addition and subtraction sentences
- Learn addition and subtraction facts
- Learn two-digit addition and two-digit subtraction
- Learn missing addends

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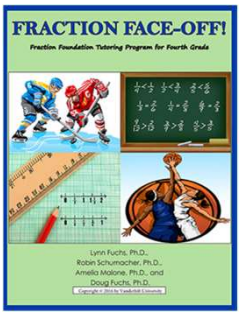

Tier 2 intervention

measurement interpretation of fractions (magnitude)

comparing and ordering fractions,

placing fractions on a 0 -1 number line,

adding and subtracting fractions, word problems

finding fractions = ½ with multiplication;

finding fractions = 1 with multiplication,

converting mixed to improper and vv.

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Fractions 4th and 5th

- Comparing two fractions
- Ordering three fractions
- Placing fractions on a 0-1 and 0-2 number line
- Solving fraction word problems
- Solving fraction calculation problems

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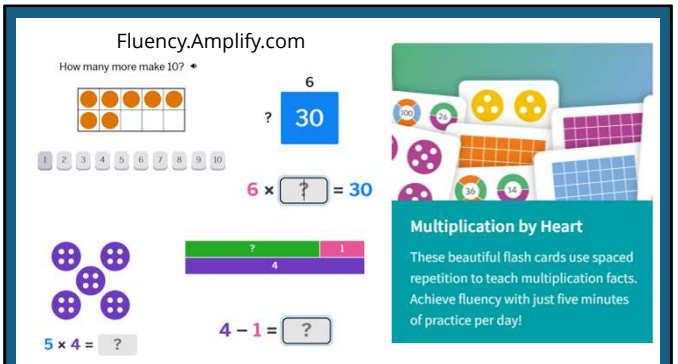

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HappyNumbers.com K-5

illuminations.nctm.org K-12

khanacademy.org/kids PreK-2

matific.com K-6

zearn.org K-5

stmath.com K-8

95

ZEARN free for teachers (was learn zillion)

Kids learn math concepts from their teacher, in the classroom.

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Impact statement SLD in Math

- **Nadia shows below average progress in Math: below 25% mastery** on grade benchmark assessments, which is causing frustration
- On an **untimed** single-digit pen and paper add and subtract test she solved **25% correctly**; she drew dots next to the numbers
- When using **counting cubes,** she solved **67% correctly**, but took longer
- Her LD in math limits her ability to do single-digit addition and subtraction in a timely fashion,
- Her limited memory results in difficulties to commit math facts to memory
- Currently Nadia is **not able to keep up with the curriculum** due to lack of accuracy and automaticity and urgently needs intervention using hands-on materials, pictorial representations, and written numerals.

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Options for frequent progress monitoring

- EasyCBM.com Grade K-8, EasyCBM.com University of Oregon
- Monitoring Basic Skills Progress Calculations Grade 1-6, Pro-Ed
- Fractions CBM Fuchs Research Group, VanderBilt University
- AAIMS Algebra progress monitoring Iowa State University
- Online: M-COMP (computation) and M-CAS (concepts and skills)

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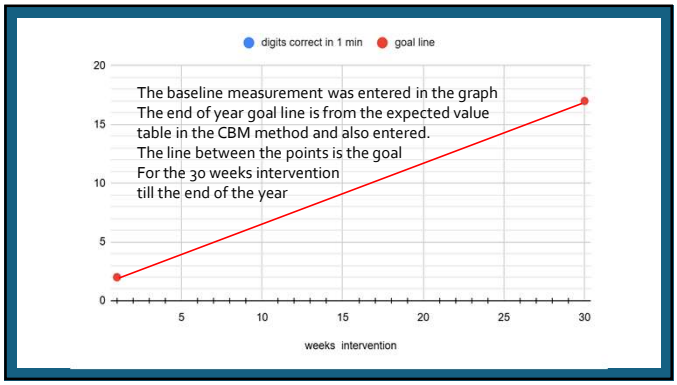

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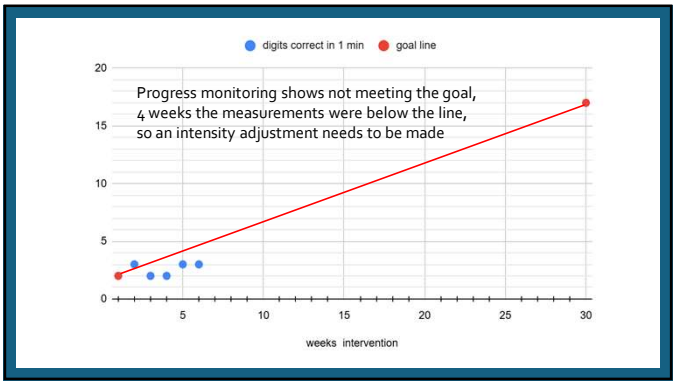

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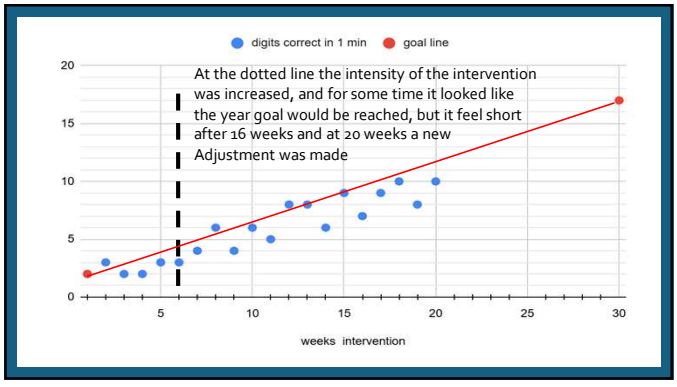

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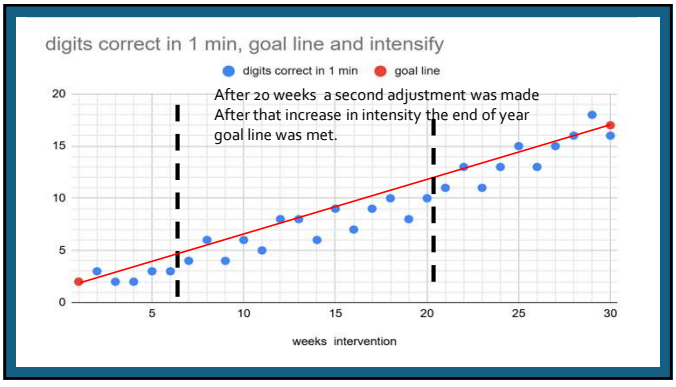

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IEP goals: add, subtract, multiply, word problems

- Given ten three-digit addition and subtraction problems, Matteo will add and subtract within 1,000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction as measured by teacher records or observations or test with 80% accuracy by the end of the year
- Matteo will multiply and divide within 100, using strategies such as the relationship between multiplication and division as measured by teacher records, observations, or test with 80% accuracy by the end of the year
- Matteo will fluently solve mixed operation calculations of third grade level at a rate of 18/min of correct answers by the end of the year
- After schema instruction, Matteo will solve one- and two-step word problems in situations involving equal groups, arrays, and measurement quantities with 75% accuracy as measured by teacher records, observation, or test by the end of the year
- Matteo will accurately measure common classroom items in whole and half inches using a ruler

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WIAT Error Analysis to Goals samples

- **Single-operation word problems: General, Time, Money**
- **Annual Goal**
- Given ___ word problems involving a single operation of addition, subtraction, multiplication, or division with one or more (*circle*: two-digit or three-digit) numbers, the student will write or say the solutions with no more than ___ errors.
- Example: David needs $149 for a game, he has $95. How much more does David need to save? (Student writes/says: 54.)
- **Short-Term Objective**
- Given ___ word problems involving a single operation of (*circle*: addition, subtraction, multiplication, division) with single-digit or two-digit numbers, the student will find the solutions with no more than ___ errors.
- Example: David had 29 old shirts, and he gave 14 to his brother. How many old shirts does David have? (Student writes/says: 15.)

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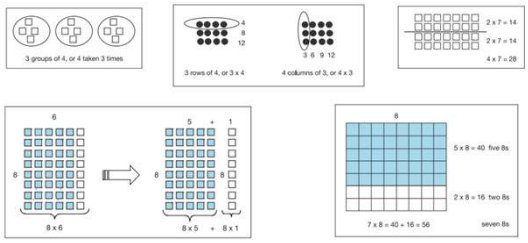
Learning multiplication strategies: doubles, split in smaller multiplications from NCTM



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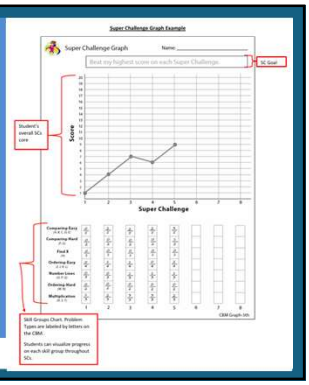
Fractions Curriculum-Based Measurements

Lynn Fuchs, Robin Schumacher, Rebecca Abramson, Ashlyn King, Sarah Krowka, Amber Wang, Amelia Malone, Rachel Pachmayr, Doug Fuchs

Vanderbilt University



By Lynn Fuchs et al Vanderbilt university

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Example impact statement MS math

- According to a recent diagnostic math assessment, Amy performs at a 5th grade level. Amy is currently **not passing** her 8th grade Pre-Algebra class. Math is the area that Amy needs the most support. She received a **did not meet score on the Math STAAR** test, while RLA scored above
- She currently receives math services for 20 minutes daily in a small group. The teacher reports that **frequent review** of concepts and materials presented in small increments is the most effective method. Amy fluently retrieves basic math facts, can do **operations with whole numbers**, **equality of fractions and decimals**, with **verbal explanation** but struggles to setup proportions to solve problems, to divide with factions, and all 4 basic operations with integers. She has difficulties with operations with mixed numbers and percentages especially multi step word-problems, which will affect her involvement and progress in the general curriculum.

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Impact statement 2

- Results of a recent benchmark test indicate that she continues to need specialized instruction in the areas of solving practical problems, proportional relationships, division with fractions, expressions/operations, order of operations, exponents/squares and square roots, and plane and solid figures.
- Although Amy continues to work toward grade-level proficiency, it is unlikely to achieve this in one year

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Measurable IEP Math goals examples

- 1. When provided a graphic organizer, Amy will be able to **compare and order (ascending and descending) three to five fractions, decimals, percentages,** as measured by classroom assignments, teacher observation and test, with **85% accuracy** by the end of the school year.
- 2.Given a graphic organizer, Amy will be able to apply the **order of operations** to simplify **numerical expressions with square numbers and square roots, fractions, decimals, and integers**, as measured by classroom assignments and tests, with **75% accuracy** by the end of the school year.
- 3. After schema-based instruction, Amy will be able to solve **single-step and two-step practical problems by using computation procedures for whole numbers, integers, fractions, and decimals**, as measured by classroom assignments, teacher observations and tests, with **75% accuracy** by the end of the school year.
- 4. Using concrete materials and pictorial representations, Amy will be able to **solve two-step linear equations and inequalities**, as measured by classroom assignments, observations, and tests, with **80% accuracy** by the end of the school year.

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Summary Dyscalculia: The Core Deficit

Dyscalculia is a deficit in "number sense," including subitizing, magnitude comparison, and estimation.

The Mental Number Line: Difficulty developing a mental number line that represents size and length.

Difficulties: with basic math facts (only count), place value, word problems, proportional thinking, graphs, models

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Developmental Dyscalculia

- starts early on in math: screen all kids in KG and 1st grade, early intervention is most effective
- it exists on a sliding scale, with each individual experiencing unique manifestations, common comorbidities dyslexia, dysgraphia
- inborn, it runs in families
- most current tests are not covering all components yet
- we need more resources

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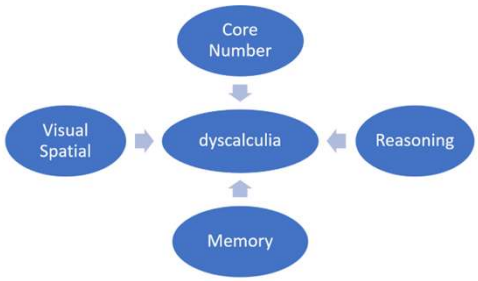

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effective intervention strategies & methods

- Practice Guides: https://ies.ed.gov/ncee/WWC
- Galaxy Math, Number Rockets, Pirate Math, Fraction Face-Off, Brain Boost: frg@vanderbilt.edu
- M-STAR intervention, Meadows Center Austin
- GAP closing Edugains Canada
- Online: Happy Numbers, ST MATH, Zearn, Matific, Amplify

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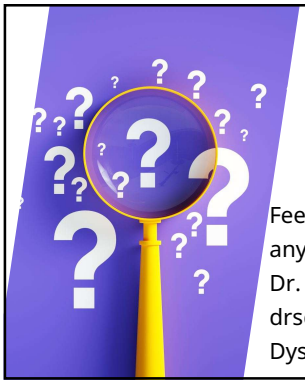

Q and A

Feel free to email me with any questions

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