

# Early-Grade Literacy and Numeracy Recovery in Diverse Elementary Classrooms A Practical MTSS Framework for Assessment, Differentiation, and Intervention Fidelity

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*Abstract- Early-grade learning recovery remains one of the most consequential instructional challenges facing elementary schools. National evidence from the 2024 National Assessment of Educational Progress shows that fourth-grade reading performance remains below pre-pandemic levels and that 40% of fourth-grade students performed below NAEP Basic in reading, while only 31% performed at or above NAEP Proficient. Mathematics has shown partial recovery, with 39% of fourth-grade students at or above NAEP Proficient and 24% below NAEP Basic, but performance remains below 2019 levels. Florida's 2025 FAST data similarly show improvement in Grades 3-5 ELA/Reading and Mathematics while preserving large absolute gaps for English learners, students with disabilities, and economically disadvantaged students. This article develops a practical multi-tiered system of support (MTSS) model for diverse elementary classrooms, centred on four linked routines: universal assessment, differentiated instruction, targeted intervention, and fidelity-monitored progress review. The manuscript synthesises research on foundational reading instruction, early numeracy, English learner literacy, data-based decision-making, and intervention fidelity. It also presents public-data analysis tables and heat maps to translate broad achievement signals into classroom-level decision rules. The proposed Assessment-Differentiation-Fidelity model argues that recovery is most credible when teachers connect standards, diagnostics, small-group intervention, accommodation fidelity, parent communication, and progress-monitoring evidence in a repeatable 6- to 12-week cycle. The article concludes that early-grade recovery should not be treated as generic remediation. It should be organised as a disciplined instructional improvement system that protects Tier 1 quality, accelerates Tier 2 support, intensifies Tier 3 intervention when growth is insufficient, and uses fidelity*

*evidence to distinguish ineffective instruction from inadequate dosage or access.*

*Keywords: Early Literacy, Early Numeracy, MTSS, Response to Intervention, Differentiated Instruction, English Learners, Students with Disabilities, Progress Monitoring, Intervention Fidelity, Florida FAST, NAEP.*

## I. INTRODUCTION

The elementary classroom is now expected to accomplish two tasks at once: deliver grade-level standards and repair unfinished foundational learning. This dual demand is especially visible in grades 1 to 5, where literacy and numeracy skills are cumulative. A learner who misses phonemic awareness, decoding, number sense, mathematical language, or early problem-solving fluency does not merely lose content; the learner loses access to future instruction. For diverse classrooms that include English learners, students with disabilities, students requiring Section 504 accommodations, and children affected by poverty, the recovery challenge is instructional, linguistic, diagnostic and organisational.

The article proposes that early-grade literacy and numeracy recovery must be treated as an implementation problem as much as a curriculum problem. Evidence-based reading and mathematics routines have limited value when schools cannot identify who needs which support, when progress data are collected but not acted upon, when accommodations are listed but not verified, or when

Tier 2 and Tier 3 interventions occur without fidelity checks. This is the reason a practical MTSS model is required: it creates a defensible system for screening, grouping, intervention delivery, progress monitoring, and adjustment.

The professional context for this manuscript is the work of an elementary educator and school leader with long experience in primary instruction, school administration, curriculum implementation, assessment preparation, special-needs lesson planning, Individualized Education Programs, and current U.S. elementary teaching. That practitioner background matters because early-grade recovery is not solved by policy statements alone. It requires teachers who can convert standards, assessment data and learner characteristics into daily classroom moves.

The article uses public national and state assessment signals, peer-reviewed intervention literature, federal practice guides, and selected research-profile sources to develop an applied framework. The goal is not to create another abstract model of remediation. The goal is to specify a usable cycle for teachers and school leaders: assess, diagnose, differentiate, intervene, monitor, verify fidelity, regroup, and communicate progress.

## II. PROBLEM STATEMENT AND RATIONALE

Learning recovery is often discussed as a post-pandemic problem, but early-grade gaps are also shaped by long-standing weaknesses in foundational-skills instruction, inconsistent intervention dosage, attendance, limited instructional time, poverty, multilingual development, and variable fidelity of implementation. NAEP 2024 results provide a national warning signal: grade 4 reading continued to decline relative to 2022 and remained below 2019; mathematics improved from 2022 but remained below the pre-pandemic level (National Center for

Education Statistics, 2025a; National Center for Education Statistics, 2025b).

Florida's FAST data show a more encouraging state trend but also confirm why recovery has to be targeted. In Grades 3-5 ELA/Reading, statewide performance at or above Level 3 increased from 54% in 2024 to 56% in 2025; in Grades 3-5 Mathematics, performance increased from 58% to 61% (Florida Department of Education, 2025). These gains are meaningful, but subgroup results reveal persistent absolute gaps. In 2025, only 22% of English learners and 31% of students with disabilities in Grades 3-5 ELA/Reading performed at or above Level 3; in Mathematics, 39% of English learners and 38% of students with disabilities did so (Florida Department of Education, 2025).

The rationale for the present article is therefore practical: educators need a recovery architecture that connects public achievement signals to classroom implementation. In the absence of a structured MTSS cycle, students are often regrouped informally, intervention time is vulnerable to schedule interruptions, and progress monitoring can become compliance paperwork rather than instructional intelligence. An evidence-aligned framework must therefore integrate standards-based instruction, diagnostic assessment, differentiation, intervention fidelity, family engagement and data-based decision rules.

## III. PUBLIC DATA SIGNALS FOR EARLY-GRADE RECOVERY

Table 1 summarises the public data signals used in this manuscript. The national data are not classroom diagnostics, but they define the scale and urgency of the recovery problem. The Florida FAST data are particularly relevant because they show how improvement can occur while large subgroup gaps remain.

Table 1. Public data signals used to frame the early-grade recovery problem. Sources: NCES NAEP 2024 reading and mathematics reports; Florida Department of Education 2025 FAST ELA and Mathematics public summaries.

Data source	Key public signal	Instructional implication
NAEP Grade 4 Reading, 2024	31% at or above NAEP Proficient; 60% at or above NAEP Basic; 40% below NAEP Basic; average score lower than 2022 and lower than 2019.	Signals severe foundational literacy recovery need and a large below-proficient population.
NAEP Grade 4 Mathematics, 2024	39% at or above NAEP Proficient; 24% below NAEP Basic; average score 2 points higher than 2022 but 3 points lower than 2019.	Signals partial recovery but persistent pre-pandemic gap and ongoing need for numeracy acceleration.
Florida FAST Grades 3-5 ELA/Reading, 2025	Overall Level 3+ increased from 54% to 56% between 2024 and 2025. English learners increased from 19% to 22%; students with disabilities from 29% to 31%.	Shows progress but large absolute gaps requiring differentiated and accommodation-sensitive instruction.
Florida FAST Grades 3-5 Mathematics, 2025	Overall Level 3+ increased from 58% to 61% between 2024 and 2025. English learners increased from 35% to 39%; students with disabilities from 34% to 38%.	Shows stronger numeracy improvement but persistent subgroup gaps requiring Tier 2/Tier 3 support.

**Figure 1. Public Recovery Indicators from NAEP Grade 4 Reading and Mathematics, 2024**

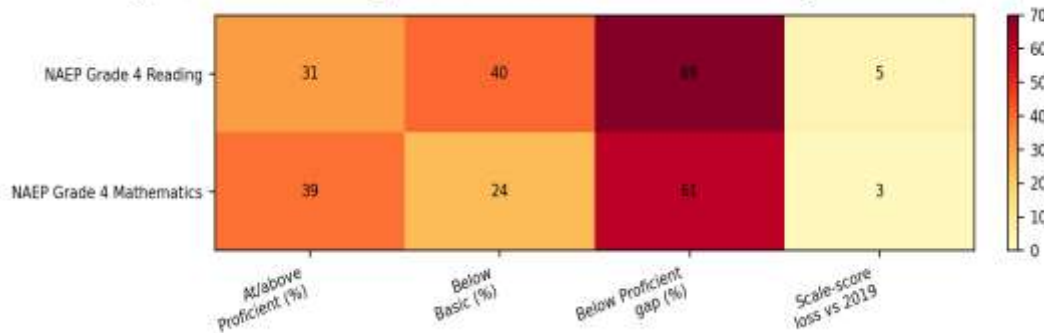


Figure 1. NAEP Grade 4 recovery indicators. Higher values in the below-basic and below-proficient columns indicate greater recovery pressure. Data source: National Center for Education Statistics (2025a, 2025b).

The NAEP data can be interpreted as a recovery-pressure index. In reading, the gap is deeper because 69% of fourth-grade students were below NAEP Proficient and 40% were below NAEP Basic. In mathematics, the below-proficient gap was 61%, but the below-basic population was substantially smaller at 24%. This does not mean mathematics recovery is complete. Rather, it indicates that reading recovery requires more intensive foundational work,

particularly for students whose decoding, fluency and comprehension skills are below the level required to access grade-level content.

### 3.1 Florida FAST Grades 3-5 Subgroup Analysis

Table 2. Florida FAST Grades 3-5 Level 3+ results by subgroup, 2024-2025. Source: Florida Department of Education (2025).

Group	ELA 2024	ELA 2025	ELA change	Math 2024	Math 2025	Math change
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Overall	54%	56%	+2 pp	58%	61%	+3 pp
African American	41%	44%	+3 pp	43%	47%	+4 pp
Hispanic	50%	52%	+2 pp	55%	58%	+3 pp
White	65%	67%	+2 pp	69%	71%	+2 pp
Students with disabilities	29%	31%	+2 pp	34%	38%	+4 pp
English learners	19%	22%	+3 pp	35%	39%	+4 pp
Economically disadvantaged	46%	47%	+1 pp	50%	52%	+2 pp

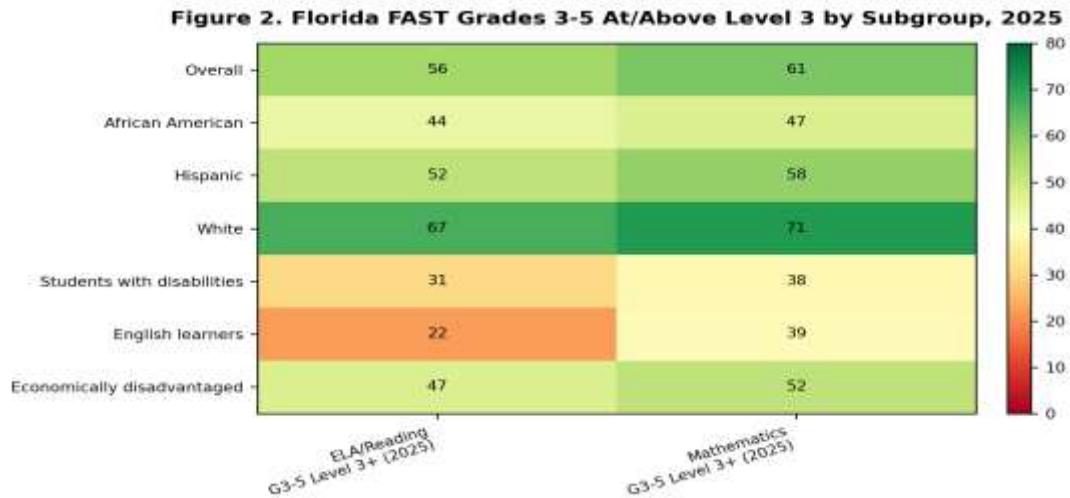


Figure 2. Florida FAST Grades 3-5 subgroup proficiency heat map. Higher values are stronger outcomes; low values highlight where MTSS intensification and accommodation fidelity are most urgent. Source: Florida Department of Education (2025).

Table 2 and Figure 2 show that growth and inequity can coexist. English learners made gains in both ELA/Reading and Mathematics, but their 2025 ELA/Reading Level 3+ rate was 45 percentage points below White students and 34 percentage points below the overall Grades 3-5 rate. Students with disabilities also gained but remained 36 percentage points below White students in ELA/Reading. The implication is that improvement should not be celebrated only at the aggregate level. A recovery model must include subgroup-sensitive data review, accommodation checks, language scaffolding, and explicit intervention aligned to the specific barrier shown by diagnostic evidence.

#### IV. LITERATURE REVIEW

##### 4.1 Foundational Literacy: From Exposure to Explicit Instruction

The early-reading literature consistently supports explicit, systematic attention to foundational skills,

including phonological awareness, phonics, fluency, vocabulary, oral language and comprehension. The What Works Clearinghouse practice guide on foundational skills for kindergarten through grade 3 identifies four evidence-based recommendations: teach academic language; develop awareness of speech sounds and their connection to letters; teach decoding, word analysis and word recognition; and ensure that students read connected text daily to support accuracy, fluency and comprehension (Foorman et al., 2016).

Meta-analytic research reinforces this direction. Wanzek et al. (2018) found that intensive early reading interventions for kindergarten through grade 3 students at risk for or identified with reading disabilities produced positive outcomes, while

Vaughn and Wanzek (2014) emphasised that students with reading disabilities often require sustained and intensified intervention rather than short, weakly implemented remediation. Hall et al. (2023), in a broad review of four decades of elementary reading intervention research, further underscores that intervention design must attend to who receives the intervention, what is taught, how long intervention lasts, and how implementation quality is monitored.

For diverse classrooms, literacy instruction cannot be reduced to phonics alone. English learners need access to the same foundational code instruction as other students, while also receiving vocabulary, oral language, background knowledge, syntax and discourse support (August and Shanahan, 2006; National Academies of Sciences, Engineering, and Medicine, 2017). Ludwig et al. (2019) found that reading interventions can be effective for English learners and should not be delayed until English proficiency is fully developed. Solari et al. (2022) likewise show that reading interventions for English learners with reading difficulties can produce meaningful effects when instruction is explicit and responsive to language needs.

#### 4.2 Early Numeracy: Number Sense, Representation and Mathematical Language

Early numeracy recovery must focus on the conceptual architecture of mathematics rather than worksheet repetition alone. Students need to understand quantity, comparison, decomposition, place value, counting principles, operations, mathematical vocabulary and the structure of word problems. A meta-analysis by Gersten et al. (2009a) on mathematics instruction for students with learning disabilities identified the value of explicit instruction, visual representations, strategic sequencing of examples, feedback and formative assessment. These components are directly relevant to Tier 2 and Tier 3 numeracy intervention.

Randomised and quasi-experimental studies of early numeracy interventions add practical guidance. Bryant et al. (2011) reported positive effects of an early numeracy intervention for first-grade students with mathematics difficulties, and Clarke et al. (2016) showed the importance of intensive

kindergarten mathematics intervention targeting number and operations. For multilingual classrooms, numeracy instruction must also address mathematical language. A student may understand a quantity concept but fail a word problem because of vocabulary, syntax, contextual unfamiliarity or weak comprehension of relational terms such as more than, fewer than, altogether, difference and remaining.

#### 4.3 Progress Monitoring and Data-Based Decision-Making

Progress monitoring is the operational bridge between assessment and instruction. Fuchs and Fuchs (2011) describe curriculum-based measurement as a method for tracking growth and deciding when instruction needs adjustment. The value of progress monitoring lies not in data collection itself but in whether teachers use trend evidence to make instructional decisions. Within MTSS, data-based decision-making involves universal screening, diagnostic assessment, progress monitoring, fidelity review and problem-solving at student, classroom and school levels (Gersten et al., 2009b; National Center on Intensive Intervention, 2024).

Recent work on data activation and dashboard design from Mupa's research profile is relevant by analogy. Mukundwi et al. (2026), in a data-activation framework for healthcare systems, emphasise classification, validation, real-time monitoring and privacy safeguards as prerequisites for trustworthy analytics. Although the domain differs, the same governance logic applies to classroom MTSS dashboards: schools must know what the data mean, who can see them, when they are updated, how missing data are handled, and how decisions are documented. Chitengu and Mupa (2026) also emphasise engagement, comprehension and assessment integrity in hybrid learning for multilingual learners; the present article adapts that logic to early-grade recovery by requiring teachers to track not only scores but also access, participation, accommodation and fidelity indicators.

#### 4.4 Intervention Fidelity and Differentiation

Differentiation is often misunderstood as simply giving different students different activities. In an MTSS recovery model, differentiation should be

evidence-aligned: students are grouped by the skill barrier revealed by screening and diagnostics, instruction is adjusted by intensity and representation, and progress data determine regrouping. This approach is consistent with differentiated instruction theory, which emphasises readiness, interest, learner profile and flexible grouping (Tomlinson, 2014).

Intervention fidelity is equally important. If a student fails to grow, the team must determine whether the intervention was the wrong match, insufficiently intense, weakly delivered, interrupted by attendance, or undermined by unimplemented accommodations. Hill et al. (2012) argue that fidelity and instructional alignment are often insufficiently reported in RTI research, which limits interpretation of intervention effects. In practice, fidelity should be documented

through dosage logs, lesson-component checklists, accommodation-use records, attendance, group size, and teacher notes on learner response.

V. PROPOSED FRAMEWORK: THE ASSESSMENT-DIFFERENTIATION-FIDELITY MODEL

This article proposes an Assessment-Differentiation-Fidelity model for diverse elementary classrooms. The model assumes that early-grade recovery must operate as a repeating cycle rather than a one-time intervention placement. Each cycle should run for 6 to 12 weeks, depending on the intensity of the concern and the reliability of the progress-monitoring measure.

Table 3. Assessment-Differentiation-Fidelity model for early-grade recovery.

Component	Purpose	Expected evidence
1. Universal screening	Use grade-appropriate screening in reading and mathematics to identify risk early.	All students are assessed with common measures; subgroup performance is reviewed.
2. Diagnostic mapping	Identify the precise barrier: phonemic awareness, decoding, fluency, vocabulary, comprehension, number sense, fact fluency, language access, attention or accommodation need.	Each at-risk learner has a primary barrier and secondary access factor recorded.
3. Differentiated Tier 1	Strengthen core instruction through explicit modelling, guided practice, vocabulary support, manipulatives, discourse routines and checks for understanding.	Core lessons include scaffolds for English learners and accommodations for students with IEP/504 needs.
4. Tier 2 intervention	Provide small-group targeted instruction 3-5 times weekly, matched to the diagnostic barrier.	Group membership, dosage, lesson focus and progress-monitoring dates are documented.
5. Tier 3 intensification	Increase time, precision, feedback, group size reduction and specialist support when Tier 2 growth is insufficient.	Students with persistent flat growth receive intensified plans and problem-solving review.
6. Fidelity and progress review	Review growth data together with fidelity, attendance, accommodation and engagement evidence.	Teams distinguish non-response caused by instructional mismatch from non-response caused by weak implementation.
7. Family communication	Provide plain-language progress updates and home practice routines.	Families understand the target skill, practice routine and next review date.

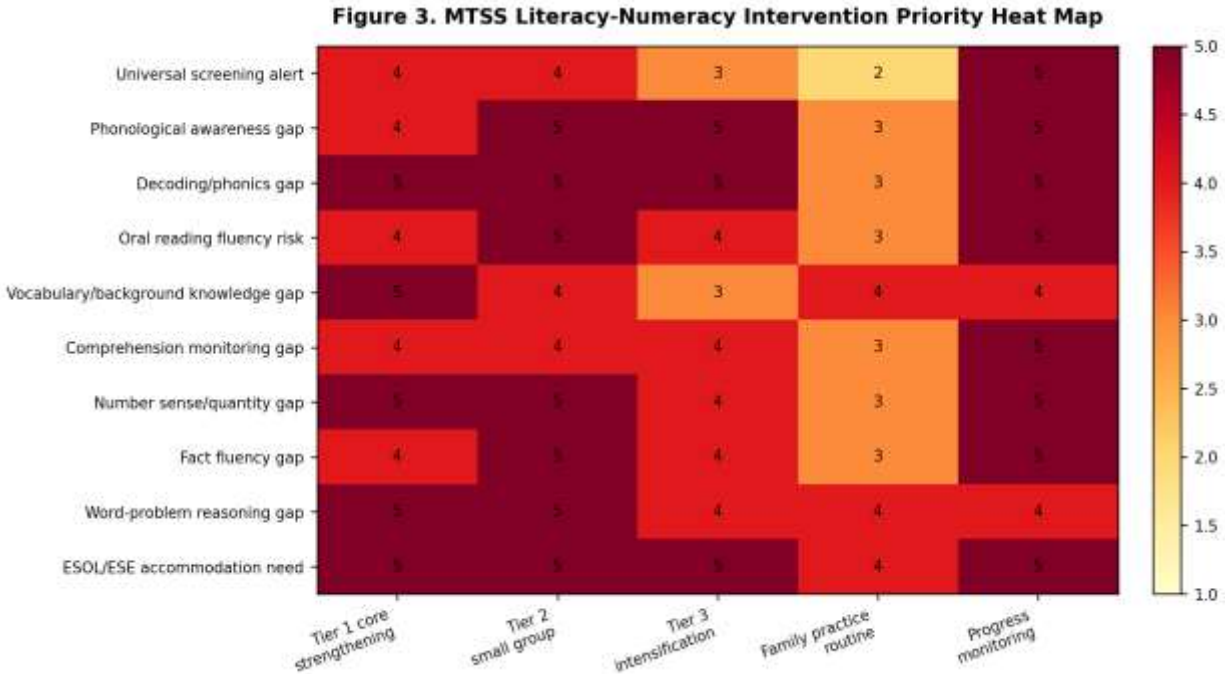


Figure 3. MTSS literacy-numeracy intervention priority heat map. Scores range from 1 = low priority to 5 = urgent priority. This is a framework matrix, not a student-level dataset.

## VI. INSTRUCTIONAL DESIGN FOR EARLY LITERACY RECOVERY

A practical literacy recovery block should include five interacting strands: oral language and vocabulary; phonemic awareness and phonics; decoding and word recognition; connected-text fluency; and comprehension. The sequence does not mean that comprehension waits until decoding is mastered. Rather, students require simultaneous access to rich oral language and meaning while receiving explicit instruction in the alphabetic code.

For first-grade and early elementary classrooms, the daily literacy routine should begin with a brief explicit skill focus, followed by guided practice, immediate feedback, connected text, and a writing or oral-language transfer activity. For English learners, teachers should pre-teach critical vocabulary, use visuals and gestures, connect to home-language knowledge where appropriate, model sentence

frames, and verify comprehension through oral response, drawing, sorting or partner talk. For students with disabilities or 504 plans,

accommodations should be visible in lesson delivery, not merely listed in records.

Tier 2 literacy intervention should be organised around skill precision. Students with phonemic awareness gaps require oral sound manipulation and phoneme-grapheme mapping; students with decoding gaps require systematic phonics and cumulative review; students with fluency risk require repeated reading of controlled and connected texts; students with vocabulary and comprehension gaps require explicit word-learning routines, oral language practice, text discussion and background knowledge building. The teacher's role is to connect the diagnostic barrier to the intervention, not simply to assign a generic reading group.

Table 4. Early literacy recovery routines aligned to foundational reading research.

Literacy strand	Instructional target	Practical routine
Phonemic awareness	Segmenting, blending, deletion, substitution; link sounds to graphemes.	2-4 minute daily warm-up; oral practice plus letter connection; error correction.
Phonics and decoding	Explicit, cumulative code instruction with decodable text.	Teach-review-practice-read-write sequence; track mastery of target patterns.
Fluency	Accuracy, rate, prosody and phrasing in connected text.	Repeated reading, partner reading, teacher modelling, brief timed checks.
Vocabulary/oral language	Academic and story vocabulary; sentence structure; narrative language.	Student-friendly definitions, visuals, examples, sentence frames, oral rehearsal.
Comprehension	Retell, inference, main idea, monitoring and text evidence.	Think-alouds, structured discussion, graphic organisers, text-dependent questions.

VII. INSTRUCTIONAL DESIGN FOR EARLY NUMERACY RECOVERY

Early numeracy recovery should be grounded in the idea that mathematics learning is both conceptual and linguistic. Students need concrete-representational-abstract experiences, mathematical vocabulary, opportunities to explain reasoning, and repeated practice that is meaningful rather than mechanical. The strongest numeracy interventions build number sense first: students compare quantities, compose and decompose numbers, connect objects to symbols, use ten-frames and number lines, and explain why an operation makes sense.

In diverse classrooms, the teacher should treat mathematical language as part of the intervention. Students may need direct instruction in terms such as compare, fewer, total, altogether, difference, equal, unknown and explain. Word problems should be modelled with diagrams, number bonds, bar models, drawings and oral reasoning before students are expected to produce symbolic equations independently. For students with disabilities, manipulatives, visual models, reduced working-memory load, repeated examples and immediate corrective feedback are essential.

Table 5. Early numeracy recovery routines aligned to mathematics intervention research.

Numeracy strand	Instructional target	Practical routine
Number sense	Counting, one-to-one correspondence, cardinality, comparison, decomposition.	Manipulatives, ten-frames, number lines, quick images and count-on routines.
Place value	Tens and ones, regrouping, expanded forms and base-ten structure.	Base-ten blocks, place-value charts, bundled sticks and verbal explanation.
Operations	Addition/subtraction concepts, strategies and fact fluency.	Part-part-whole, number bonds, strategy talk, targeted fluency practice.
Mathematical language	Understanding relational and operational vocabulary.	Vocabulary cards, sentence frames, oral rehearsal and multilingual support.
Problem solving	Representing, selecting operations, explaining and checking reasonableness.	Drawings, bar models, schema instruction, partner explanation and worked examples.

VIII. ASSESSMENT, PROGRESS MONITORING AND DECISION RULES

A defensible MTSS system requires clear decision rules. Without decision rules, grade teams may over-

rely on impressions, and students can remain in weakly matched intervention groups for too long. Decision rules should specify when screening occurs, which diagnostic measures are used after risk identification, how often progress is monitored, what

rate of improvement is expected, and what actions follow when progress is adequate, questionable or insufficient.

For early reading, progress monitoring can use curriculum-based measures such as letter-sound fluency, phoneme segmentation, nonsense-word fluency, oral reading fluency or comprehension probes depending on grade level and skill target. For

early mathematics, measures may include number identification, quantity discrimination, missing number, computation probes, fact fluency, number sense tasks and problem-solving checks. The key is alignment: a phonics intervention should not be evaluated only through broad comprehension scores, and a number-sense intervention should not be judged only by end-of-unit computation tests.

Table 6. Recommended data and decision rules for early-grade recovery cycles.

Data routine	Timing	Decision purpose	Evidence to retain
Universal screening	All students, 3 times yearly or per district schedule	Identify risk and assign diagnostic follow-up.	Screening report by class, grade, subgroup and skill.
Diagnostic assessment	At risk or below benchmark students	Locate the specific skill barrier and access factor.	Diagnostic profile: primary barrier, secondary barrier, language/accommodation factor.
Tier 2 progress monitoring	Every 1-2 weeks	Check whether intervention is producing adequate growth.	Trend line, goal line, attendance and fidelity notes.
Tier 3 progress monitoring	Weekly or more frequently for severe risk	Decide whether to intensify, change intervention or evaluate further.	Weekly probe results, intervention log, specialist notes.
Fidelity review	Biweekly or monthly	Determine whether non-response is due to weak delivery or poor match.	Dosage log, lesson checklist, group size, attendance, accommodation record.
Parent communication	At start, midpoint and review meeting	Create shared understanding of target skill and home routine.	Plain-language progress note and practice guidance.

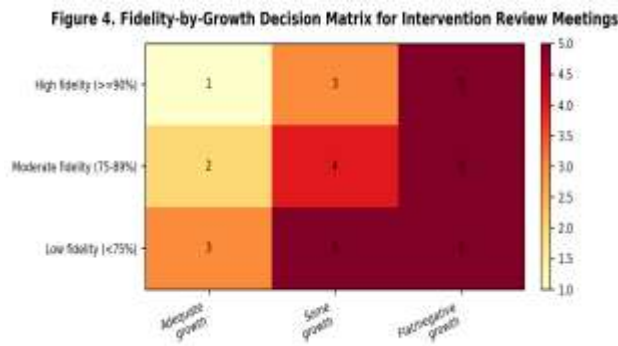


Figure 4. Fidelity-by-growth decision matrix. Scores range from 1 = maintain and monitor to 5 = urgent problem-solving and intensification.

Figure 4 prevents a common implementation error: interpreting flat growth as student failure without checking implementation. If fidelity is high and growth is flat, the intervention should be changed or intensified. If fidelity is low and growth is flat, the immediate problem is implementation, scheduling, training, attendance or accommodation access. If fidelity is moderate and growth is partial, the team should strengthen dosage and precision before moving the student unnecessarily. This logic is especially important for English learners and students with disabilities because low growth can reflect a mismatch between intervention content, language access and accommodation fidelity.

IX. THE 12-WEEK CLASSROOM IMPLEMENTATION CYCLE

trend data and short enough to avoid leaving students in ineffective supports for an entire semester.

The proposed model can be implemented through a 12-week cycle. The cycle is long enough to observe

Table 7. A 12-week MTSS classroom implementation cycle.

Period	Focus	Teacher/team actions	Evidence product
Weeks 1-2	Screening and diagnostics	Administer universal screening; review prior data; identify risk; conduct diagnostics; check ESOL/ESE/504 accommodation needs.	Class risk roster and diagnostic map.
Weeks 3-4	Group and launch intervention	Create skill-based groups; set intervention schedule; communicate with families; begin fidelity logs.	Group plan and family note.
Weeks 5-6	First progress review	Review early progress, attendance and fidelity; adjust grouping if mismatch is obvious.	Progress trend and fidelity notes.
Weeks 7-8	Instructional intensification	Increase modelling, guided practice, corrective feedback or dosage for students with weak response.	Revised intervention plan.
Weeks 9-10	Second progress review	Compare trend line to goal line; check accommodation use and student engagement.	Decision record: continue, intensify, change, or fade support.
Weeks 11-12	Cycle evaluation and regrouping	Summarise outcomes, celebrate growth, regroup for next cycle and document unresolved concerns.	Cycle report and next-cycle roster.

X. DIFFERENTIATION FOR ENGLISH LEARNERS, STUDENTS WITH DISABILITIES AND ECONOMICALLY DISADVANTAGED LEARNERS

The Florida subgroup data make clear that early-grade recovery must be designed for learner variability. English learners should not be excluded from evidence-based literacy or mathematics intervention while waiting for English proficiency to develop. Instead, interventions should include oral language, vocabulary, visuals, modelling, sentence frames, repeated practice, and comprehension checks. Where possible, students' home language should be treated as an asset for building concepts and background knowledge.

Students with disabilities and students with 504 plans require more than placement in an intervention

group. They require accommodation fidelity. If an IEP or 504 plan provides extended time, small-group setting, read-aloud conditions, manipulatives, assistive technology, visual supports or behaviour supports, the teacher should record whether those supports were actually provided during core instruction, intervention, assessment and progress monitoring.

Economically disadvantaged learners may need recovery systems that consider attendance, homework resources, home reading access, transportation, nutrition, device access and parent work schedules. Family engagement should therefore be practical, not burdensome. A five-minute decodable text routine, a number talk using household objects, or a vocabulary conversation may be more feasible than complex homework packets.

Table 8. Differentiation and access supports for diverse elementary classrooms.

Learner group	Priority access issue	Recommended support
English learners	Vocabulary, oral language, syntax, background knowledge, academic conversation, mathematical language.	Visuals, gestures, sentence frames, partner rehearsal, explicit vocabulary, home-language bridges, repeated directions.
Students with disabilities	Skill deficit plus accommodation fidelity, working memory, processing speed, attention and access.	IEP/504 checks, explicit modelling, smaller steps, manipulatives, assistive technology, feedback, reduced cognitive load.
Economically disadvantaged learners	Attendance, access to books/tools, family time constraints, interrupted practice.	School-based practice time, take-home decodable texts, simple family routines, supplies, flexible communication.
Students with persistent non-response	Possible need for intensification, specialist input, or evaluation.	Tier 3 plan, weekly data, fidelity audit, specialist consultation, family meeting.

XI. DISCUSSION: WHAT THE DATA AND LITERATURE SUGGEST

Three findings emerge from the public data analysis and literature synthesis. First, reading recovery appears more urgent than mathematics recovery at the national grade 4 level, because 40% of fourth-grade students were below NAEP Basic in reading and 69% were below NAEP Proficient. Second, Florida's Grades 3-5 FAST results show that aggregate improvement can coexist with large subgroup gaps, especially for English learners and students with disabilities. Third, research on intervention indicates that learning recovery requires explicit instruction, diagnostic matching, sufficient dosage, progress monitoring and fidelity verification. The proposed model therefore rejects two extremes. It rejects a deficit-only view that treats struggling students as incapable, and it rejects a generic-inclusion view that places students in grade-level lessons without sufficient scaffolding. Instead, the framework argues for inclusive precision: all students receive strong core instruction, and students with specific barriers receive targeted support that is matched, monitored and adjusted.

For school leaders, the implication is that MTSS should be managed as an instructional quality system. The school should know how many students are below benchmark by skill, how many are receiving Tier 2 or Tier 3 supports, whether intervention sessions are delivered as scheduled, whether students

with accommodations actually receive them, whether English learners have language scaffolds, and whether progress data show enough growth to justify continuing the same support.

XII. RECOMMENDATIONS FOR PRACTICE

- Use skill-level diagnostics after universal screening. Broad screening tells the teacher that a learner is at risk; diagnostics identify why.
- Protect Tier 1 core instruction. Intervention cannot compensate for weak core instruction if most students are not receiving explicit, standards-aligned teaching.
- Create small groups by skill need, not by general performance label. A decoding group, fluency group, vocabulary group and number-sense group should not receive the same intervention.
- Use progress monitoring to decide, not merely to document. Data should trigger decisions about continuing, intensifying, changing or fading support.
- Require fidelity evidence in every intervention review meeting. No team should interpret non-response without checking dosage, attendance, lesson delivery and accommodation access.
- Embed ESOL and ESE supports inside intervention plans. Language access and accommodation fidelity should be part of the intervention design, not separate compliance matters.

- Communicate with families in plain language. Families should know the target skill, the practice routine, the progress signal and the next review date.
- Use heat maps and dashboards at the grade-team level. Visual analytics help teachers identify whether gaps are isolated, subgroup-specific or system-wide.

### XIII. LIMITATIONS AND ETHICAL USE OF DATA

The public data used in this article are aggregate indicators and should not be interpreted as diagnostics for any individual school or classroom. NAEP is a national assessment, and its achievement levels are not the same as state grade-level proficiency. Florida FAST results are state assessment summaries and must be interpreted within the state's standards, test design and reporting rules. The article therefore uses these data to frame the recovery problem and illustrate analytic routines, not to make causal claims about a specific classroom.

The heat maps in this article are tools for interpretation. Figures 1 and 2 use public data. Figures 3 and 4 are implementation matrices derived from the literature and practitioner logic. When schools use actual student data, they must protect student privacy, follow district data governance policies, and avoid public reporting of identifiable small-cell data. Data should be used to improve instruction, not to stigmatise learners, teachers or families.

### XIV. CONCLUSION

Early-grade literacy and numeracy recovery must be precise, inclusive and fidelity-monitored. The national and Florida data show both the seriousness of the recovery challenge and the possibility of progress. However, progress will be inequitable if schools rely only on aggregate improvement and do not examine subgroup gaps, diagnostic barriers, intervention quality and accommodation fidelity.

The Assessment-Differentiation-Fidelity model developed in this article provides a practical route for

diverse elementary classrooms. It begins with universal screening, moves to diagnostic mapping, strengthens Tier 1 instruction, adds targeted Tier 2 and Tier 3 intervention, monitors progress, verifies fidelity and communicates with families. Its central claim is simple: recovery is not a packet, a program or a slogan. Recovery is a disciplined instructional system in which teachers know what each student needs, deliver the support with fidelity, monitor whether it works, and adjust before another year of foundational learning is lost.

### REFERENCES

- [1] Anderson, S., Jungjohann, J. and Gebhardt, M. (2020) "Effects of using curriculum-based measurement for progress monitoring in reading and mathematics", *Frontiers in Education*, 5, pp. 1-12.
- [2] August, D. and Shanahan, T. (eds.) (2006) *Developing literacy in second-language learners: Report of the National Literacy Panel on Language-Minority Children and Youth*. Mahwah, NJ: Lawrence Erlbaum Associates.
- [3] Bryant, D.P., Bryant, B.R., Roberts, G., Vaughn, S., Pfannenstiel, K.H., Porterfield, J. and Gersten, R. (2011) "Early numeracy intervention program for first-grade students with mathematics difficulties", *Exceptional Children*, 78(1), pp. 7-23.
- [4] Chitengu, B.M. and Mupa, M.N. (2026) "Hybrid Learning for Social Sciences: An Evidence-Informed Model for Improving Outcomes Among Multilingual Learners in Geography and History", *Iconic Research and Engineering Journals*, 9(10), pp. 530-538.
- [5] Clarke, B., Doabler, C.T., Nelson, N.J., Kosty, D.B., Fien, H., Baker, S.K. and Smolkowski, K. (2016) "Testing the efficacy of a kindergarten mathematics intervention by small-group size", *Journal of Learning Disabilities*, 49(2), pp. 152-164.
- [6] Connor, C.M., Morrison, F.J., Fishman, B., Schatschneider, C. and Underwood, P. (2007) "Algorithm-guided individualized reading instruction", *Science*, 315(5811), pp. 464-465.

- [7] Deno, S.L. (1985) "Curriculum-based measurement: The emerging alternative", *Exceptional Children*, 52(3), pp. 219-232.
- [8] Florida Department of Education (2024) *English Language Arts and Mathematics: 2024 Assessment Results*. Tallahassee, FL: Florida Department of Education.
- [9] Florida Department of Education (2025) *English Language Arts and Mathematics: 2025 Assessment Results*. Tallahassee, FL: Florida Department of Education.
- [10] Foorman, B., Beyler, N., Borradaile, K., Coyne, M., Denton, C.A., Dimino, J., Furgeson, J., Hayes, L., Henke, J., Justice, L., Keating, B., Lewis, W., Sattar, S. and Wissel, S. (2016) *Foundational skills to support reading for understanding in kindergarten through 3rd grade*. Washington, DC: Institute of Education Sciences, What Works Clearinghouse.
- [11] Fuchs, L.S. and Fuchs, D. (2011) *Using curriculum-based measurement for progress monitoring in reading*. Washington, DC: National Center on Student Progress Monitoring.
- [12] Gersten, R., Beckmann, S., Clarke, B., Foegen, A., Marsh, L., Star, J.R. and Witzel, B. (2009b) *Assisting students struggling with mathematics: Response to Intervention for elementary and middle schools*. Washington, DC: Institute of Education Sciences, What Works Clearinghouse.
- [13] Gersten, R., Chard, D.J., Jayanthi, M., Baker, S.K., Morphy, P. and Flojo, J. (2009a) "Mathematics instruction for students with learning disabilities: A meta-analysis of instructional components", *Review of Educational Research*, 79(3), pp. 1202-1242.
- [14] Gersten, R., Compton, D., Connor, C.M., Dimino, J., Santoro, L., Linan-Thompson, S. and Tilly, W.D. (2009) *Assisting students struggling with reading: Response to Intervention and multi-tier intervention in the primary grades*. Washington, DC: Institute of Education Sciences, What Works Clearinghouse.
- [15] Hall, C., Dahl-Leonard, K., Cho, E., Solari, E.J., Capin, P., Conner, C.L., Henry, A.R. and Cook, L. (2023) "Forty years of reading intervention research for elementary students with or at risk for dyslexia: A systematic review and meta-analysis", *Reading Research Quarterly*, 58(2), pp. 285-312.
- [16] Hill, D.R., King, S.A., Lemons, C.J. and Partanen, J.N. (2012) "Fidelity of implementation and instructional alignment in Response to Intervention research", *Learning Disabilities Research & Practice*, 27(3), pp. 116-124.
- [17] Ludwig, C., Guo, K. and Georgiou, G.K. (2019) "Are reading interventions for English language learners effective? A meta-analysis", *Journal of Learning Disabilities*, 52(3), pp. 220-231.
- [18] Mukundwi, B., Vengesai, D.T., Mupa, M.N., Chiwanga, R., Hove, T.L. and Gezah, F.Y. (2026) "Bridging Data Fragmentation: A Unified Data Activation Platform for AI-ready Healthcare Systems in Africa", *ResearchGate preprint/publication record*.
- [19] Mupa, M.N. (2026a) *ResearchGate profile: Munashe Naphtali Mupa*. Available at: <https://www.researchgate.net/profile/Munashe-Naphtali-Mupa/research> (Accessed: 7 June 2026).
- [20] Mupa, M.N. (2026b) *Google Scholar profile: Munashe Naphtali Mupa*. Available at: <https://scholar.google.com/citations?hl=en&user=JmqqLHQAAA AJ> (Accessed: 7 June 2026).
- [21] National Academies of Sciences, Engineering, and Medicine (2017) *Promoting the educational success of children and youth learning English: Promising futures*. Washington, DC: The National Academies Press.
- [22] National Center for Education Statistics (2025a) *NAEP Report Card: 2024 Reading Assessment, Grade 4*. Washington, DC: U.S. Department of Education.
- [23] National Center for Education Statistics (2025b) *NAEP Report Card: 2024 Mathematics Assessment, Grade 4*. Washington, DC: U.S. Department of Education.

- [24] National Center on Intensive Intervention (2024) Data-based individualization and progress monitoring resources. Washington, DC: American Institutes for Research.
- [25] National Mathematics Advisory Panel (2008) Foundations for success: The final report of the National Mathematics Advisory Panel. Washington, DC: U.S. Department of Education.
- [26] Petscher, Y., Cummings, K.D., Biancarosa, G. and Fien, H. (2013) "Advanced applications of curriculum-based measurement in reading", *Assessment for Effective Intervention*, 38(2), pp. 71-83.
- [27] Powell, S.R. and Fuchs, L.S. (2018) "Effective word-problem instruction: Using schemas to facilitate mathematical reasoning", *Teaching Exceptional Children*, 51(1), pp. 31-42.
- [28] Slavin, R.E., Lake, C., Chambers, B., Cheung, A. and Davis, S. (2009) "Effective reading programs for the elementary grades: A best-evidence synthesis", *Review of Educational Research*, 79(4), pp. 1391-1466.
- [29] Solari, E.J., Petscher, Y. and Fien, H. (2022) "Effectiveness of interventions for English learners with reading difficulties: A meta-analysis", *Learning Disabilities Research & Practice*, 37(3), pp. 194-208.
- [30] Stecker, P.M., Fuchs, L.S. and Fuchs, D. (2005) "Using curriculum-based measurement to improve student achievement: Review of research", *Psychology in the Schools*, 42(8), pp. 795-819.
- [31] Tomlinson, C.A. (2014) *The differentiated classroom: Responding to the needs of all learners*. 2nd edn. Alexandria, VA: ASCD.
- [32] Vaughn, S. and Wanzek, J. (2014) "Intensive interventions in reading for students with reading disabilities: Meaningful impacts", *Learning Disabilities Research & Practice*, 29(2), pp. 46-53.
- [33] Wanzek, J. and Vaughn, S. (2007) "Research-based implications from extensive early reading interventions", *School Psychology Review*, 36(4), pp. 541-561.
- [34] Wanzek, J., Stevens, E.A., Williams, K.J., Scammacca, N., Vaughn, S. and Sargent, K. (2018) "Current evidence on the effects of intensive early reading interventions", *Journal of Learning Disabilities*, 51(6), pp. 612-624.