A is for all

Meeting the literacy needs of students with and without disabilities in the New York City public schools

A report by Advocates for Children of New York
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About Advocates for Children

Since its founding in 1971, Advocates for Children of New York (AFC) has been protecting the education-related needs of children most at risk of academic failure or school-based discrimination due to such factors as poverty, disability, race, ethnicity, language barriers, immigration status, homelessness, or involvement in the child welfare or juvenile justice system. AFC's mission is to promote access to the best education New York can provide for all students, especially students of color and students from low-income backgrounds. AFC uses integrated strategies to advance systemic reform, empower families and communities, and advocate for the educational rights of individual students.

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— Johanna Duran, mother of a student with dyslexia
New York City Council oversight hearing, October 2014

LITERACY IN ACTION

Executive summary

When Josh came to Advocates for Children of New York (AFC) at age 20, he was desperate to learn how to read. He could not understand menus at restaurants, read emails from friends, or write anything except his name. Despite years of failing to make academic progress, and having been identified as needing special education services for a language-based learning disability when he was in second grade, Josh had not received an appropriate education at any school he attended. In addition, the New York City Department of Education (DOE) had incorrectly told Josh's mother that their obligation to provide services ended when he turned 18; as a result, he had been out of school for two years. He had attempted to find vocational training on his own, but was unsuccessful in the programs he found due to his inability to read and write. When Josh's mother learned from another parent that he had the right to attend school until age 21, she attempted to find him a new placement, but the assistant principal at the only school offered by the DOE told her that Josh was "not going to learn how to read in this school." AFC intervened and got Josh an evaluation, which established that he had the ability and potential to read at a higher level and needed immediate remediation. We requested an impartial hearing and successfully secured intensive, one-on-one reading instruction for him. Josh was a hardworking and eager student who made enormous progress once he received the support he needed: he jumped from a first grade reading level to a fourth/fifth grade level within the first six months of specialized tutoring. Five years after we first met him, Josh earned his high school equivalency diploma.

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When parents send their children off to school, they assume that, if nothing else, their children will learn how to read and write proficiently during their years in the classroom. After all, as reading researcher Dr. Louisa Moats has aptly noted, "The most fundamental responsibility of schools is teaching students to read."[1] Literacy—the ability to draw meaning from print—is the essential foundation for later learning and success in school and in life. Yet our public schools are struggling to fulfill this fundamental responsibility for far too many children. Every year, Advocates for Children of New York (AFC) receives hundreds of phone calls from parents seeking help for children who are years behind in reading, at times having made it to middle or high school without ever having mastered the basic skills necessary to read street signs or restaurant menus, let alone academic texts. And every year, we see such students make remarkable gains when they finally receive high-quality, evidence-based instruction that targets their individual needs. More often than not, however, these students are able to obtain such instruction only in private special education schools or via private tutoring services. The New York City Department of Education (DOE) can and must do better.

Both nationally and in New York City, there are significant disparities in literacy skills based on students' race/ethnicity, socioeconomic background, and disability status.[2] In this paper, we focus specifically on the gap between students with disabilities and their non-disabled peers, keeping in mind that, given the demographics of the New York City public schools, both populations are predominantly students of color and students from low-income backgrounds.[3] Approximately 187,000 City students attending district schools have Individualized Education Programs (IEPs),[4] a

population greater than the *total* public school enrollment of Washington, D.C. and Boston, Massachusetts—*combined*.[5] Less than 7 percent of these students in grades 3 through 8 achieved proficiency on the New York State English Language Arts (ELA) exam in 2015. (This number does not include students with disabilities who are exempt from taking the exam because of the nature of their disability.) The consequences are grave: children who do not become proficient readers in elementary school are at increased risk for behavioral and mental health challenges, are less likely to graduate from high school, and are more likely to live below the poverty line as adults.

Importantly, the problem is not that struggling readers and students with disabilities are incapable of learning to read; it is that we are failing to teach them effectively. Thanks to brain imaging studies and decades' worth of reading research, much is known about how the brain learns to read, why some children have learning difficulties, and how we can best teach all children to be literate. As director of the Tufts University Center for Reading and Language Research, Dr. Maryanne Wolf, explains in her book *Proust and the Squid*, none of us is "born to read."[6] Reading is a cultural invention, not an ability that is inherent to human biology. The current problem is twofold: in some cases, students are referred for special education services because they are struggling with reading, but their difficulties are due entirely to a lack of adequate instruction. With appropriate instruction, grounded in the extensive scientific knowledge of reading development, in a well-resourced classroom with skilled and supported teachers, such students could be functioning at grade level. In other cases, students who have dyslexia, autism spectrum disorders, and other disabilities do not have access to the interventions and specialized teaching methodologies proven to help them learn. By providing effective, evidence-based reading instruction to all students in the general education classroom, along with early, targeted, evidence-based intervention for students having difficulties, schools can prevent unnecessary referrals to special education and focus the most intensive, individualized interventions on those students who have the most significant learning needs.

The problem is not that struggling readers and students with disabilities are incapable of learning to read; it is that we are failing to teach them effectively.

This report reviews research on literacy instruction for students with and without disabilities, highlights a number of promising programs around New York City, and concludes with recommendations for

addressing the troubling gaps in literacy achievement. The research literature in this area is vast, making a comprehensive review far beyond the scope of this paper. We discuss relevant research to the extent that it illuminates the challenges facing educators and is necessary for understanding how and why particular interventions are effective. In addition, while literacy includes both reading *and* writing, we have narrowed our inquiry by focusing solely on reading.[7] In discussing promising practices in reading instruction, it is essential to recognize at the outset that no one methodology or program will work best for every child, every classroom, or every school. There can never be a one-size-fits-all approach to literacy instruction. We are thus not recommending the wholesale adoption of any specific program or teaching strategy; rather, we seek to summarize overarching, research-validated principles and demonstrate that success *is* possible with expert teaching and sufficient resources. Since a comprehensive review of literacy instruction at all 1,800 New York City public schools would have been unfeasible, in choosing programs to visit and showcase, we were guided by our conversations with and recommendations from (1) AFC's direct services staff, based on their experiences with families; (2) others working in the field, including members of the ARISE Coalition (a citywide coalition, coordinated by AFC, that pushes for systemic reform in special education); and (3) staff from the DOE's Division of Teaching and Learning. While each school and program is not without its own limitations and challenges, together they illustrate that this is not an unsolvable or hopeless problem. Across the five boroughs, there are countless teachers doing good work and helping struggling readers make gains. Unfortunately, more often than not, educators do not have the resources and support they need, and the lack of system-wide coordination and infrastructure means that whether or not an individual student is promptly identified and matched with an appropriate, effective literacy intervention is largely a matter of luck and family resources.

No one methodology or program will work best for every child, every classroom, or every school. There can never be a one-size-fits-all approach to literacy instruction.

Ensuring that all New York City schools are equipped to provide excellent reading instruction to students with and without disabilities will require long-term investment and an unwavering, system-wide commitment to the ultimate goal of teaching *every* child how to read. Yet this is an investment we cannot afford *not* to make. In addition to the impact on individual children's lives, experts argue that students who do not successfully become literate "incur so many costs to the

education system…that even very expensive interventions can be justified on cost-effectiveness grounds alone."[8] We are encouraged by Mayor Bill de Blasio and Chancellor Carmen Fariña's recent commitment to ensuring that every elementary school has access to a dedicated reading coach by 2018, with the goal of all second graders reading on grade level by 2026.[9] With this important investment as a strong beginning, we ask that the Department of Education:

- *Develop a comprehensive, multi-year plan* for meeting the literacy needs of *all* students, including students with disabilities. In creating such a plan, the DOE should assess the system's current capacity, gather feedback from stakeholders, and set specific goals, with a timeline, budgetary needs for meeting them, benchmarks for assessing progress, and mechanisms for oversight and sustainability.
- *Prepare and support classroom teachers.* This means establishing partnerships with teaching colleges to improve pre-service training for future teachers, as well as providing extensive, ongoing professional development and support for teachers currently in the classroom.
- *Build literacy expertise in every school*, including elementary, middle, and high schools, District 75 schools, and District 79 programs, via dedicated, highly trained expert teachers of reading who can both provide coaching and instructional support for classroom teachers *and* deliver individualized, evidence-based interventions to struggling readers.
- *Use technology to support instruction*, including Assistive Technology (AT), instructional technology, and Accessible Educational Materials (AEM).
- *Improve communication with families* so that they are able to support their children's literacy development and obtain assistance when they need it.

With the recent expansion of universal pre-K in New York City, more than 68,000 four-year-olds are now in the classroom for the first time. It is vital we ensure that, at every step in the educational journey they are just beginning, they receive the quality instruction they need to become lifelong readers. At the same time, we cannot leave behind the more than one million students in the grades above them, both those still in elementary school and struggling adolescents.

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The scope of the problem

"[Third grade] didn't go well. She was depressed. She said she didn't know what was going on. Every day she was saying she was sick [because] she didn't want to go to school. She says she doesn't understand why she can't read like her friends, why she is having these difficulties. She can barely read a menu. Nothing is helping."[10]

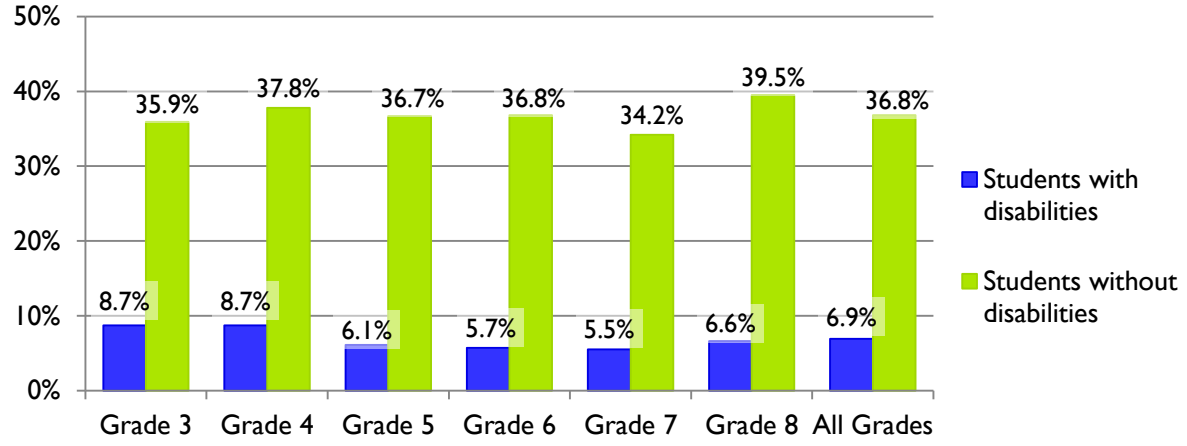
— Parent of a 9-year-old with a learning disability

"I really did not know what to do. I was worried for my daughter. She didn't know how to read and she didn't know how to write and she was left back two years. She was trying hard. She makes an effort. She wants to learn."

— Parent of a 14-year-old sixth grader reading on a second-grade level

In 2015, only 6.9 percent of New York City students with disabilities scored at or above proficient on the grades 3–8 New York State English Language Arts (ELA) exam. This does not include students with the most severe disabilities, who instead complete the New York State Alternate Assessment. In comparison, 36.8 percent of City students without disabilities achieved proficiency (see figure 1). While we recognize the many limitations of standardized tests as a measure of achievement, test scores—while just one data point—very clearly and quickly illustrate the existence of a massive gap between students with disabilities and their non-disabled peers.

FIGURE 1. New York City students* scoring at or above proficient (level 3 or 4) on the 2015 New York State English Language Arts (ELA) exam.



*Does not include New York City students attending public charter schools, as the test results for charter school students publicly available on the DOE's website are not disaggregated by disability status.

Source: New York City Department of Education (DOE). (2015). NYC Results on the New York State 2014-2015 ELA Test (Grades 3-8), Citywide Summary, Results by Disability Status. Retrieved from: http://schools.nyc.gov/Accountability/data/TestResults/ELAandMathTestResults.

The failure of the public schools to teach *all* students how to read is devastating to their educational development. Literacy is the gateway to all other academic content; success in the upper elementary grades and beyond depends on students' ability to gain information from text. By the end of third grade, when students make the transition from "learning to read" to "reading to learn," children who are still struggling to master basic skills will have increasing difficulties comprehending, analyzing, and mastering subject-area material, such as science and social studies. Students who struggle with reading are also inclined to avoid it, thus falling further and further behind their peers.[11] Without intensive, targeted intervention, such deficits tend to widen over time, initiating a negative academic trajectory and increasing disengagement from school and the risk of high school dropout. According to a national longitudinal study, students who are not proficient readers by grade 3 are four times more likely than proficient readers to fail to graduate high school in four years.[12] Unsurprisingly, graduation outcomes for students with disabilities are as abysmal as their ELA scores in third grade: only 38 percent of New York City students with disabilities graduate in four years, as compared to 73 percent of their non-disabled peers.[13]

Without intensive, targeted intervention, such deficits tend to widen over time, initiating a negative academic trajectory and increasing disengagement from school and the risk of high school dropout.

In addition to academic difficulties, students who lack grade-level literacy skills face significant social-emotional challenges. Students who struggle with reading frequently experience embarrassment, anxiety, and frustration as they are unable to keep up with their classmates. Particularly in the late elementary school years and beyond, such frustration and discouragement may manifest in negative feelings about school, low self-esteem, and aggressive behavior. As a result, poor reading skills are correlated with an increased risk for behavioral problems, and students with reading disabilities have higher rates of anxiety disorders and depression than their peers.[14] In our casework at AFC, we frequently meet students who avoid going to school or who are disruptive in class—often resulting in suspension or even leading to court involvement—because they are afraid of being called on by their teacher and do not want their classmates to find out that they are unable to read. As the United Federation of Teachers has similarly observed, "Behavior and reading…are linked in a vicious cycle."[15]

Further, strong literacy skills are essential to participation in the

twenty-first century labor force. The literacy demands of most jobs, particularly those in growing sectors of the economy, have increased in recent decades, while the number of jobs not requiring advanced literacy skills has declined significantly. Those students who leave school with limited reading ability are at a significant disadvantage in the labor market, limiting their own opportunities for success and social mobility, as well as New York City's economic growth and competitiveness. By failing to invest in literacy instruction for all students, we are losing out on untold human capital.[16] Adults with low literacy levels are less likely to be employed full time, are more likely to be out of the labor force entirely, and are more likely to have incomes that put them below the poverty line.[17] Beyond employment and earnings, literacy is required for full, independent functioning in society as an adult. Many tasks of daily living—for example, following a recipe or understanding health care instructions—require at least basic literacy skills.

The abysmal outcomes seen for students with disabilities in New York City are not the inevitable result of disability itself. Rather, access to resources makes a significant difference when it comes to the ability of struggling readers and students with disabilities to succeed.

While the human brain is innately wired for spoken language—a typically developing child will learn to speak the language used in his or her surrounding environment without needing direct, explicit instruction in how to talk—reading is a relatively recent cultural invention. Evolution has left humans preprogrammed for speech, but there are no genes or neurological structures specific only to reading. Learning to read is a process that requires the brain to make new connections among areas that developed for other purposes, such as visual processing and spoken language, and establish a new neural "reading circuit." While the brain is highly plastic, able to rearrange itself and repurpose evolutionarily older pathways to master this complex skill, because reading is a human invention rather than inherent to our biology, it does not happen organically. Some children will find learning relatively effortless, but many others will need much more intensive and explicit instruction.[18]

Although the principles of reading instruction have been well established by scientists and practitioners, as a recent report on dyslexia from the Emily Hall Tremaine Foundation and the Campaign for Grade-Level Reading notes, unfortunately, "successful practices still are not reaching many (perhaps most) of the kids who are struggling readers, especially those from low-

income families who attend under-resourced schools."[19] The abysmal outcomes seen for students with disabilities in New York City, 78 percent of whom are eligible for free or reduced-price lunch, are *not* the inevitable result of disability itself.[20] Rather, access to resources—enabling prompt and accurate evaluation of individual need and the provision of high-quality interventions and supports—makes a significant difference when it comes to the ability of struggling readers and students with disabilities to succeed.[21] For example, the national study linking third-grade reading proficiency to likelihood of high school graduation also found that while more than one in four children living in poverty who are not reading proficiently by third grade fail to graduate on time, less than one in ten of their peers who have similar third-grade reading ability but live in affluent communities do not earn a diploma in four years.[22]

What we know about instruction for students with reading disabilities should be applied widely, to reach all children, regardless of official special education status.

Reading difficulties exist along a continuum across the population, with no precise, fixed demarcation between "disabled" and "non-disabled." Dyslexia, the most frequently occurring learning disability, exists in varying degrees of severity, and diagnosis reflects an arbitrary cut-off point in the continuum, not a wholly distinct category. In all likelihood, struggling readers who fall near any particular cut-off point will experience functional difficulties, even if they do not qualify for special education services. Thus, while exact estimates of the prevalence of dyslexia vary, ranging from one in every five children to one in ten, literacy experts generally agree that about 20 percent of *all* children will experience significant difficulties in learning to read. Moreover, the same instructional strategies are effective for both children displaying a discrepancy between IQ and reading achievement—the criterion historically (though no longer exclusively) used for diagnosing dyslexia—and children who are low-achieving readers but have no such discrepancy.[23] Therefore, many experts in the field suggest that what we know about instruction for students with reading disabilities should be applied widely, to reach all children, regardless of official special education status. As the previously mentioned report from the Emily Hall Tremaine Foundation and the Campaign for Grade-Level Reading argues, "If we can get more children with learning disabilities reading at grade level, we'll have a better shot at reaching the same goal for all kids in all schools. And if we can't move the needle for this group of struggling readers, it's unlikely that we will succeed with the population overall."[24]

How children learn to read

"At the end of first grade I spoke to her teacher about my concerns and her teacher said, you know, don't worry about it. She'll grow out of it."

— Parent of a student with a learning disability

"He will try to sound out the words, but it's like he can't get it. He just cannot read. He's embarrassed, and [his peers] make fun of him. Then the anger comes up. If you can't read, you're going to act out, because people tease you. The emotion comes out and you can see the frustration, and he runs and kicks walls, because he can't do it. He would say, 'I'm trying, I'm trying, I don't know why I can't.' [His siblings] want him to read to them, and he is the older one, and he can't read the book to them. And they look up to him, like, 'you're my big brother, read for me.' He wants to read. He wants to show people that he can do it. When he can't, he gets angry and he gets frustrated, and he just acts out."

— Grandmother of an 11-year-old reading at a kindergarten level

The vast majority of literacy experts agree that a successful reading program for students with and without disabilities must include systematic, explicit instruction in the foundational skills that underlie proficient reading. The comprehensive research reviews conducted by the National Reading Panel and the National Early Literacy Panel firmly established the early literacy skills that develop from ages zero to five as well as the "five pillars" of K–12 reading instruction (phonemic awareness, phonics, fluency, vocabulary, and comprehension).[25] Direct instruction in each of the five pillars is especially important for struggling readers and children with disabilities; students should not have to infer what they are supposed to know or do. Broadly speaking:

- *In preschool*, children develop the essential pre-reading, or "emergent literacy," skills they need to become successful readers in the coming years. Children who enter kindergarten with a gap in these skills—including phonological awareness, alphabet knowledge, and oral vocabulary—are more likely to struggle in learning to read.[26]
- *In kindergarten and first grade*, children "break the code" linking print and spoken language.
- *From second through fifth grade*, children strengthen decoding skills, gain automaticity in reading, and develop comprehension strategies that enable them to make sense of a variety of texts. Quality instruction in early elementary school is essential for future success, but does not guarantee it, and many students will not make the transition to "reading to learn" automatically or without effort.[27]
- *In middle and high school*, students continue to build vocabulary and comprehension skills throughout content-area instruction as they engage with increasingly complex and specialized texts. Students learn disciplinary literacy, practices specific to reading texts in academic disciplines such as science and history.[28]

It is important to note that rigorous, systematic, skills-based literacy instruction is *not* synonymous with drills and standardized assessments, nor is it incompatible with developing a love of books and reading. On the contrary, children who are unable to get the words off the page because of inadequate instruction in foundational skills will find no joy in reading and will avoid it as much as possible. Well-designed and well-implemented literacy activities will complement—not displace—play-based, child-driven learning in pre-K and kindergarten, and will not come at the expense of social-emotional development or a rich, engaging curriculum.

Systematic, skills-based literacy instruction is not synonymous with drills and standardized assessments, nor is it incompatible with developing a love of books and reading. On the contrary, children who are unable to get the words off the page because of inadequate instruction in foundational skills will find no joy in reading and will avoid it as much as possible.

EMERGENT LITERACY

Oral language, alphabet knowledge, and print awareness[29]

Experiences in the first five years of life are crucial to a child's literacy development.[30] As the National Institute for Early Education Research notes, "Learning to read and write is an ongoing process from infancy. Contrary to popular belief, it does not suddenly begin in kindergarten or first grade."[31] The recent expansion of universal pre-K in New York City provides an unprecedented opportunity to prevent future reading difficulties by providing high-quality early literacy experiences to thousands of students who might otherwise start kindergarten already behind. For example, a beginning reader's ability to draw meaning from print is dependent on the existing knowledge of words, facts, and ideas that he or she brings to the text, but by first grade, children from high-income families typically know about twice as many words as children from low-income backgrounds.[32] Similarly, children with severe or multiple disabilities typically have fewer early literacy experiences than their non-disabled peers, as learning to read is often considered less of a priority.[33] Therefore, one important objective of pre-K is to help ensure all children build oral language skills and networks of knowledge about the world. Successful strategies for such learning include, for example, shared storybook reading paired with rich conversation between child and adult, also known as dialogic reading.[34]

Alphabet knowledge, or the ability to distinguish and identify letters, is an emergent literacy skill that is a strong and reliable predictor of later reading achievement. Literacy-rich early childhood environments provide opportunities for children to engage with and

develop an understanding of the role of letters and their connection to spoken language.[35] Regular exposure to the alphabet helps children learn to recognize letters as special symbols that are different from other shapes and that can be distinguished from one another. Use of environmental print, such as signs and labels around the classroom, reinforces that text communicates important information.[36] Through repeated reading of favorite books, children learn that letters make words and words tell stories, which stay the same every time they are read. Finally, early experiences with books and reading teach essential "concepts of print," such as knowing how books are held and handled (e.g., how and when to turn the page) and knowing that (in English) text is read from left to right and from the top of the page to the bottom.[37]

PHONOLOGICAL & PHONEMIC AWARENESS

Phonological and phonemic awareness are strong and reliable predictors of future reading achievement.[38] Phonological awareness is a broad skill that involves the ability to hear and manipulate the sounds of oral language—for example, breaking words into syllables and recognizing rhyme and alliteration. Phonemic awareness, a subtype of phonological awareness, is the ability to hear, isolate, and manipulate the individual sounds, or phonemes, that are the smallest units composing spoken words. Before children can "break the code" of written text by mastering the relationships between the sounds of oral language and the letters that represent those sounds in print, they must first understand that spoken words are composed of and can be broken down into smaller units of sound. Many children who have difficulties learning to read do so because of deficits in phonological awareness and processing; without this understanding, the concept of "sounding out" unfamiliar words makes little sense. Similar to the vocabulary gap, preschoolers from low-income families typically demonstrate lower phonological and phonemic awareness skills than their more advantaged peers, as do preschoolers with speech or language impairments as compared to their non-disabled peers.[39]

Educators can help children build phonological and phonemic awareness by drawing attention to the sounds (not just the meanings) of words and the articulation of those sounds, engaging children in language play, and providing opportunities for children to practice identifying and manipulating units of language. Such activities involve rhyming, blending sounds into words, segmenting words into syllables or phonemes, and inserting or deleting phonemes to create new words.[40] Evidence shows that direct, systematic phonological and phonemic awareness training, beginning in pre-K and continuing through first grade, improves children's reading skills, with effects lasting well beyond the end of instruction.[41] Students at risk for later reading difficulties, including children with developmental delays or disabilities, especially benefit from instruction that is interactive, carefully sequenced, and explicit: teachers define new concepts using very clear, precise language; model correct responses to new tasks; engage students in extensive supported practice; and progress from easier exercises to more difficult ones.[42] Verbal or visual cues—for example, using hand gestures to represent putting sounds together in blending exercises or pulling them apart in segmenting exercises—can support learning, especially for children with disabilities.

PHONICS

Phonics instruction helps children learn and apply the alphabetic principle, the concept that written text is a code in which letters correspond with units of sound in spoken words in predictable ways.[43] This element of a reading program teaches the relationships between the 44 phonemes of English and the letters or letter combinations that represent those sounds in print. Children learn how to use this knowledge to decode, or "sound out," unfamiliar words. Phonics is a means to an end—the ability to read and understand print—*not* the end itself. Research has consistently, unambiguously found that systematic and explicit phonics instruction is significantly more effective than non-systematic phonics in teaching children to read, and it has the greatest impact on achievement when it occurs in kindergarten and first grade.[44] Systematic, explicit instruction is characterized by direct teaching of sound-symbol correspondences in a clearly defined, linguistically logical sequence. Instruction is cumulative, with each new concept building upon what has already been learned, and progresses from the easiest skills and most consistent patterns to those of increasing difficulty or irregularity. Teachers provide unambiguous, step-by-step explanations and modeling, and students have extensive opportunities for practice, with teachers gradually reducing the level of support as students learn to apply their knowledge of phonics at the word level and when reading complete texts. In addition to letter-sound relationships, evidence-based programs include teaching of the structure of language and the meaningful parts of words, including prefixes, suffixes, base words, and roots. Such instruction, often called "word study" or "word work," draws students' attention to how the structure of words conveys meaning and develops students' ability to analyze and manipulate morphemes, the smallest units of meaning or grammatical function within words. Beginning readers learn how to strategically use knowledge of morphology and spelling patterns to break multi-syllabic or unfamiliar words into smaller, recognizable chunks to determine meaning and pronunciation.[45]

FLUENCY

Fluency is the ability to read text accurately, effortlessly, smoothly, and with appropriate expression.[46] Fluent readers recognize known words automatically, both in isolation and when reading text, without having to sound them out each time; they are able to rapidly and unconsciously integrate visual information (what the word looks like) and auditory information (what the word sounds like) and retrieve words stored in long-term memory. Fluency can be thought of as the bridge between decoding and comprehension. Students whose reading is slow and laborious will have difficulty remembering and understanding what they have read, as their attention will be devoted to decoding individual words, limiting the time and energy available for focusing on the ideas contained within a passage. The aim of fluency instruction is not merely to increase the speed with which students read, but to help students gain the automaticity that frees up cognitive resources and provides time to think and draw meaning from print. Fluency comes through practice. Research in both general and special education settings has found evidence that repeated oral reading (a student reads and rereads a passage out loud) with teacher modeling and immediate feedback is effective in helping students become fluent readers.[47]

VOCABULARY

It is significantly easier to decode words one has heard, said, and seen many times before, and how a reader experiences any text is determined by the quantity and quality of information he or she already has stored about the words within it.[48] Rich knowledge of a word's meanings, associations, uses, and functions in different contexts (e.g., knowing that *bear* and *bug* are not just the names of animals but are also used as verbs) is essential for comprehension. Vocabulary learning is incremental and cumulative, and gains in word knowledge in early childhood correlate with future reading comprehension skills.[49] Research has demonstrated that children learn and retain new vocabulary when words are taught in semantic categories—classified according to their meanings and connections—and embedded in broader units of instruction rather than introduced in isolation. Children typically need to be exposed to a new word multiple times over an extended period in order to fully learn and integrate it into their vocabulary, and so make greater gains when provided with extensive opportunities to practice, review, and engage with new vocabulary in meaningful contexts. Struggling readers and students with disabilities benefit from explicit instruction that clearly identifies and explains the meaning of new words and that teaches word origins and derivations (e.g., Greek and Latin roots). Direct teaching of vocabulary is particularly important for domain-specific words that are used in academic texts but not encountered in students' everyday lives.

COMPREHENSION

The ultimate goal of reading is that of constructing meaning via interaction with print. Students who can successfully translate written letters into spoken language but who do not understand or remember what they are decoding are not really reading. From the beginning of schooling through the end of high school, students learn the processes by which successful readers engage with text.[50] Comprehension instruction emphasizes meta-cognition, the process of actively thinking about one's own thinking, and builds students' capacity to self-monitor, recognizing and resolving problems with understanding as they occur. Students learn, for instance, how to recognize common structures of narrative and informational texts, as well as how to use a variety of strategies, such as summarizing a passage's main idea, visualizing what is described in a text, and activating background knowledge to support comprehension. A teacher might explain why and when a strategy is useful, model the process of applying the strategy by "thinking aloud" while reading, and guide students in practicing the strategy until they are successful working independently. Comprehension instruction also provides students with opportunities to engage in discussions about texts that go beyond surface-level questioning and encourage students to draw inferences, make connections, and analyze an author's purpose.

Response to Intervention (RtI)

"Appropriate [general education] instruction in reading shall mean scientific research-based reading programs that include explicit and systematic instruction in phonemic awareness, phonics, vocabulary development, reading fluency (including oral reading skills) and reading comprehension strategies … A school district shall take appropriate steps to ensure that staff has the knowledge and skills necessary to implement a response to intervention program."

— Regulations of the New York State Commissioner of Education [8 NYCRR §100.2(ii)][51]

A MULTI-TIERED APPROACH • Response to Intervention (RtI) is a school-wide, multi-tiered approach for identifying struggling students and providing early intervention and support.[52] While RtI provides a sound framework for implementing literacy instruction, New York City currently lacks the infrastructure to do so effectively or systemically.

- In the context of literacy, the first level of RtI, or **tier 1 instruction**, consists of evidence-based reading instruction for all students in the general education classroom. Instruction is differentiated, such as through use of flexible instructional groupings.
- A key component of RtI is **universal screening** of all students for potential reading difficulties at the beginning of the school year and at least twice mid-year. As early as pre-K, research-based screening tools can determine the likelihood that a child is at risk for later reading failure.[53]
- Students identified as needing extra help are provided with supplemental **tier 2 instruction** in order to remediate skill deficits and prevent more severe problems. These interventions take place *in addition to* (not in place of) the core literacy curriculum and are accompanied by more frequent progress monitoring. They typically occur several times per week, in 20–40 minute sessions, in homogenous groups of three to five students.
- Students who do not make adequate progress in tier 2 will receive increasingly intensive and individualized **tier 3 instruction**.

THE OBJECTIVE • If implemented well, an RtI program has the potential to ensure both that students are not unnecessarily referred for special education due to a lack of appropriate instruction and that those students with reading disabilities are identified early, before they experience failure. Unfortunately, however, New York City has not yet provided the staff development, resources, and funding that would be necessary to fully and successfully implement RtI across the public schools.

INTERVENTIONS • Schools should not let students fall further behind before receiving help; rather, interventions should be provided immediately, according to initial screening results.

- Increasing the time a student spends in an intervention (more sessions per week, sessions of greater length, and/or a greater duration of weeks) and decreasing the size of the instructional group are both evidence-based methods for increasing the intensity of an intervention.
- Research indicates that students who are fast-tracked to tier 2 or 3 display significantly stronger reading skills by the end of the school year than do those students who wait at less intensive tiers before moving up.[54]

RELATIONSHIP TO SPECIAL EDUCATION • Under the Individuals with Disabilities Education Act (IDEA), identification of specific learning disabilities may be based on a student's failure to respond to evidence-based interventions provided through the RtI process.

- New York State regulations require schools to use RtI as part of the special education referral process for students in grades K–4 with suspected learning disabilities in reading. Schools must notify parents in writing if their child is receiving supplemental interventions.
- The RtI process *cannot* be used to delay or deny special education evaluation when a student is suspected of having a disability.[55]

LITERACY IN ACTION
P.S. 112M Jose Celso Barbosa

P.S. 112 Jose Celso Barbosa is a pre-K–2 school serving children living in its zone in East Harlem (District 4). Over 90 percent of P.S. 112 students are children of color, 20 percent are English Language Learners (ELLs), and 35 percent receive special education services.[56] The school has an ASD Nest Program, in which students with autism spectrum disorders are integrated into its classrooms.[57] Because the school does not continue past the second grade, there are no state test scores demonstrating its effectiveness. However, the school has been recognized by the New York State and New York City Departments of Education as well as by the National Center for Learning Disabilities for its success in addressing the learning needs of low-income students and children with disabilities.

INSTRUCTION IN THE FIVE PILLARS OF READING

Instruction at P.S. 112 illustrates many of the principles of an effective core reading program described in the preceding section. The school's daily 120-minute literacy block includes instruction in phonemic awareness, phonics, fluency, vocabulary, and comprehension, and teaching is explicit, an essential characteristic of all evidence-based programs. The school uses Wilson Fundations® for daily phonemic awareness and phonics instruction for all students. Fundations, a program designed for tier 1 and 2 instruction in the general education classroom, teaches foundational skills in a structured, sequential, cumulative manner, a research-based best practice. School staff has found that many of their students need support developing vocabulary and background knowledge, and so the literacy curriculum builds students' oral language and comprehension skills via shared reading and inquiry-based learning, which emphasizes rich student-to-student discussions and questioning. Vocabulary learning occurs in the context of thematic units, not in isolation. Teaching also focuses on meta-cognitive strategies; throughout the school day, children are expected to explain their thinking and justify how they arrived at an answer or opinion. P.S. 112 differentiates instruction via flexible instructional groups and push-in support in every general education classroom; as a recent profile in *New York Teacher* noted, "not a single teacher in the school is alone in the classroom during reading workshop."[58] (For instance, an intervention teacher might work with a small group of students who need extra phonics instruction while the rest of the class participates in a shared read-aloud.)

INTERVENTIONS FOR STRUGGLING READERS

There is a school-wide, multi-tiered system of intervention at P.S. 112, and all students are screened for reading difficulties at the beginning of the school year and multiple times throughout the year. The school's RtI team meets twice a month to discuss student progress and determine an appropriate intervention action plan for every student who has been identified as at risk. Interventions are targeted to individual student needs, based on data and progress monitoring. This recognition that

struggling readers have a variety of needs and no one intervention will work for every student is an important strength. One P.S. 112 teacher told *New York Teacher*, "It's not just a matter of choosing the right programs, it's about how to use them flexibly to support best practices."[59]

Intensive, individualized intervention is provided via Reading Recovery, an evidence-based pull-out intervention for first-grade students that consists of one-on-one tutoring by a highly trained reading teacher, in daily sessions of 30 minutes.[60] Staff has found the program to be very effective in improving the literacy skills of students with and without disabilities, though students with disabilities have a slower rate of growth. Another available intervention at P.S. 112 is Reading Rescue, a program in which paraprofessionals work one-on-one with at-risk students, which also has demonstrated effectiveness.[61] Paraprofessionals providing the intervention at P.S. 112 receive training from the Teachers College Reading & Writing Project. P.S. 112 has also purchased Lexia Reading, an evidence-based computer program that teaches all five foundational skills, for their struggling readers. As a student responds to questions, this technology-based intervention adapts instruction accordingly, based on the student's strengths and weaknesses. Finally, struggling students with and without disabilities also receive support from teachers and reading specialists during the school's extended day program. Students needing more targeted phonics instruction, for example, may work with a Reading Recovery teacher during after-school time. The extended day program also uses Fountas and Pinnell's Leveled Literacy Intervention (LLI), which provides systematic, explicit instruction in the five pillars of reading, in small groups of three to four students, using a series of "leveled" texts of increasing difficulty. An independent study conducted in the Denver public schools found that LLI had a positive impact on the literacy achievement of participating students, particularly in kindergarten and first grade.[62]

TEACHER TRAINING, COLLABORATION, & SUPPORT

According to leaders at P.S. 112, much of the school's success stems from a strong teaching staff, a culture of learning and collaboration amongst teachers, and the commitment of significant resources. As the school's principal, Eileen Reiter, describes, "As a school community, all stakeholders collaborate towards targeting each student's progress." Principal Reiter prioritizes funding for literacy interventions and ongoing teacher training, because effectively meeting each student's needs "involves the continuous refinement of our teaching practices in literacy."[63] P.S. 112 has one part-time and two full-time Reading Recovery teachers and one additional reading intervention teacher, all of whom work with at-risk students one-on-one and in small groups, both during the school day and during extended day. The school has seven model teachers who support their colleagues, and teachers are encouraged to visit and observe one another's classrooms. Professional development is responsive to teacher interests and needs, with staff identifying areas in which they want to deepen their expertise, based on where their students are experiencing difficulties. Teachers participate in collaborative inquiry groups, which meet weekly, on topics such as oral language development and RtI. Teachers also meet in grade-level teams and in vertical instructional teams, regularly reviewing and analyzing data on student progress and studying best practices.

Preparing expert teachers of reading

"The fact that teachers need better training to carry out deliberate instruction in reading, spelling, and writing should prompt action rather than criticism. It should highlight the existing gap between what teachers need and what they have been given."

— Louisa Moats, PhD, writing for the American Federation of Teachers
Teaching Reading IS Rocket Science, June1999

"Encountering their hopeful faces each day, I tried new pedagogical methods as fast as I could learn them in hopes that something would catch…I still did not know how to catch students up. I got little professional development or feedback at school. To get my official teacher's certificate, my nights were consumed by my master's program in English education, where I had to argue about Foucault, not practice pedagogy. By the end of my second year teaching, I found myself in need of more support, unsure where to turn, and on the precipice of quitting."

— Amy Piller, Assistant Principal, Urban Assembly Unison School
Vox, February 2016[64]

An effective core reading program must provide instruction in all five National Reading Panel components—phonemic awareness, phonics, fluency, vocabulary, and comprehension—but just because a given program incorporates all five does not mean it will automatically be effective in teaching children to read. Practically speaking, many other factors come into play, one of the most important of which is the level of expertise possessed by the teacher providing the instruction. Learning to read is not a natural, easy process for many children, and thus teaching students how to read is a demanding, complex task that requires significant skill and training. Simply knowing how to read oneself is *not* sufficient preparation. Teachers need deep knowledge of the science of reading and the structure of language if they are to be able to effectively sequence instruction, explain new concepts, adapt the curriculum in response to student needs, and identify and address problems early on.[65] For example, in order to effectively provide phonics instruction, teachers must themselves understand letter-sound relationships, syllable types, and spelling patterns on a much deeper level than a typical adult reader. Such conscious understanding is essential to know which elements to introduce before others and to be able to choose clear, appropriate examples for modeling and student practice. Finally, as researcher Dr. Maryanne Wolf has noted, because literacy instruction cannot be one-size-fits-all, "we need teachers who are trained to use a toolbox of principles that they can apply to different types of children."[66] A teacher must be able to interpret an individual child's miscues and understand *why* he or she is having difficulty in order to address his or her needs.

If teaching children how to read is the fundamental responsibility of K–12 schools, then teaching teachers how to teach reading is the fundamental responsibility of teacher preparation programs.

Unfortunately, however, the majority of teacher education programs do not equip new teachers with the foundational knowledge and skills they need to be successful when they enter the classroom. A 2006 study by the National Council on Teacher Quality (NCTQ) found that only 15 percent of schools of education were providing future elementary school teachers with even cursory instruction in all five components of reading, as established by the National Reading Panel.[67] By 2014, that percentage had increased only slightly, to 17 percent, and the organization noted, "There is no adherence to *any* approach to reading in teacher education: Most teacher candidates are taught that they need to develop their own unique approach to reading."[68] Other research has similarly found that pre-service teachers receive minimal training in sound-symbol correspondences and the structure of language, identifying and supporting students with dyslexia, or teaching subject-area reading comprehension skills to adolescents.[69]

Given the shortage of quality pre-service training, intensive and sustained professional development, focused on specific teaching methods and classroom strategies, must fill the gap for teachers already in the classroom. Highly scripted reading programs, even when evidence-based, cannot replace teacher expertise, as any program is only as good as its implementation. A knowledgeable, well-trained teacher will know how to use such published curricula effectively and will be able to maximize any given program's effectiveness for the individual students in his or her classroom. A recent meta-analysis of studies of K–5 reading programs, involving more than 50,000 children, concluded that "what matters for student achievement are approaches that fundamentally change what teachers and students do together every day."[70] A similar synthesis of research on programs for middle and high school students drew the same conclusion.[71] Sending teachers to a handful of workshops or handing them a box of materials is insufficient; long-term professional development and support is necessary if teachers are to make lasting, substantive changes in their practice. Teachers must receive extensive training in evidence-based approaches and ongoing coaching on *how* to use those new approaches and materials effectively in their own classrooms, with their own students, on a day-to-day basis.[72]

Learning to read is not a natural, easy process for many children, and thus teaching students how to read is a demanding, complex task that requires significant skill and training. Highly scripted programs, even when evidence-based, cannot replace teacher expertise, as any program is only as good as its implementation.

LITERACY IN ACTION
Reading Reform Foundation of New York
P.S. 102K The Bayview

Reading Reform Foundation of New York is a non-profit organization dedicated to building the capacity of K–3 public school teachers to teach reading. When invited into a school by the principal, the organization's model for professional development consists of intensive training and in-classroom coaching, thus giving teachers the practical skills they need to provide evidence-based reading instruction in the general education classroom. As Reading Reform explains, their founders made an observation similar to that which NCTQ made two decades later: "most teachers are expected to teach reading, writing, and spelling without ever having taken a course that effectively taught them how to do it." When teachers struggled, "It had nothing to do with their abilities…And certainly it was not a question of desire to be excellent teachers. The only thing they lacked was a solid approach that worked."[73]

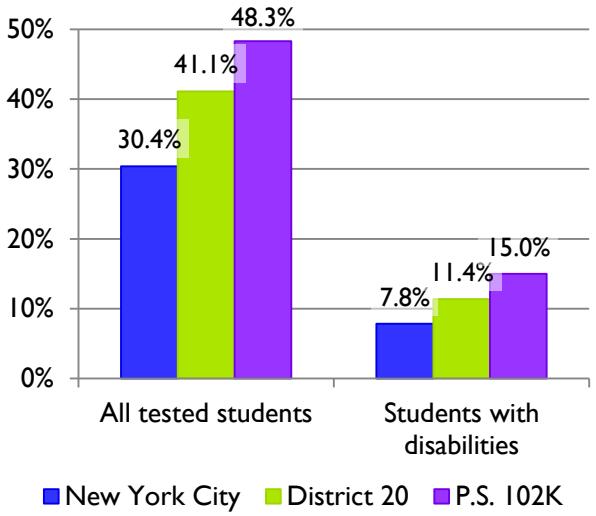
Two to four teachers at a participating school undergo professional development per year, on a volunteer basis; Reading Reform intentionally scales up over a period of several years in order to build buy-in. Teachers in the program first take a 30–45 hour graduate-level Reading Reform course, typically during the summer months. This course provides a background in the five pillars of reading and the principles of structured literacy instruction, as well as an introduction to proven techniques for teaching reading, writing, and spelling. The program's research-based methodology teaches beginning readers the relationships between sounds and letters and the rules of written language in a systematic, logical way, using multiple modalities—hearing, saying, seeing, and writing—to reinforce learning. Reading Reform consultants then spend a full school year working with the teacher one-on-one in his or her own classroom, visiting twice a week and providing 120 hours of on-the-ground training and individualized coaching. The consultant models lessons and works in collaboration with the teacher to prepare daily lesson plans and deliver instruction in the classroom. In addition, Reading Reform provides instructional materials and decodable storybooks, written to correspond with the letter-sound relationships students have learned. Through read-alouds, students also have the opportunity to engage with more difficult texts than they are yet able to decode on their own.

In the 2015-16 school year, Reading Reform consultants are working with 56 teachers in fifteen public schools across New York City. We visited P.S. 102 The Bayview, a K–5 school in Bay Ridge, Brooklyn (District 20) that has been a Reading Reform partner school since the 2009-10 school year. Sixteen percent of P.S. 102 students receive special education services, slightly less than the citywide average; 15 percent are English Language Learners; and 65 percent are economically disadvantaged, as compared to 77 percent citywide.[74] Both P.S. 102 kindergarten teachers whose classrooms we observed in early 2015 noted that undergoing professional development through Reading Reform had revolutionized their teaching and their ability to support their students' learning; if anything, they

wished they had had such knowledge and training sooner. In 2015, 48 percent of all tested students at P.S. 102 and 15 percent of students with disabilities scored at or above proficient on the state ELA test, higher than the district and citywide averages (see figure 2).

Changing one's professional practice cannot happen overnight, and this sustained level of coaching enables teachers to put what they learn in their coursework fully into action, while also maintaining fidelity to Reading Reform's instructional methodology. Rather than learning about a new reading program in a vacuum with minimal follow-up, teachers learn *how* to implement the program effectively when working with their own students. Teachers have the ongoing, real-time support they need when they have questions and encounter challenges. Reading Reform consultants, many of whom are former public school teachers, undergo a year of training themselves before mentoring other teachers; in addition to completing two 30-45 hour Reading Reform classes, new consultants spend a full school year shadowing an expert consultant in the field. A program analysis conducted by researchers at the Graduate Center of the City University of New York (CUNY) concluded that students whose teachers were participating in the Reading Reform program made substantial gains over the course of the school year, especially in kindergarten and first grade. On average, students' growth, as measured by the Gates-MacGinitie Reading Tests®, was greater than would be expected based on the test's norming sample.[75]

FIGURE 2.
Students in grades 3–5 scoring at or above proficient (level 3 or 4) on the 2015 New York State ELA exam.



Source: New York City Department of Education, NYC Results on the New York State 2014-2015 ELA Test (Grades 3-8), School, District, and Citywide Summaries.

Students with learning disabilities in reading

When Shawn, who came to New York City from Haiti as an elementary school student, entered the ninth grade, he knew only a handful of letters and had never successfully read a full sentence on his own. Shawn had previously been identified as a student with a learning disability, but made little progress in his self-contained special education classes. He was promoted from grade to grade because he worked hard and behaved well, but his inability to read prevented him from becoming a confident, engaged learner. Luckily, Shawn's high school, New Visions Charter High School for Advanced Math and Science III in Brooklyn, recognized his difficulties with reading and worked collaboratively with Advocates for Children to get Shawn the support he needed. Over the past two and a half years, Shawn's special education teacher has provided five hours of remedial tutoring per week in a group of just two students, using an intensive, evidence-based intervention called the Wilson Reading System®. In addition, AFC secured for Shawn five hours per week of one-on-one private tutoring after school, using the same methodology. Wilson Reading System® is a program designed specifically for students with learning disabilities and/or severe decoding deficits that directly teaches foundational skills in a highly structured, multisensory manner; with Wilson instruction targeting his specific needs, Shawn has made tremendous progress that has carried over to all of his coursework. He is more confident participating in class, has passed three Regents exams, and is on track to graduate with a local diploma in 2017. As his special education teacher, Anna Spoden, notes, the success of Shawn and other students like him "is direct proof that special education interventions are successful and will change these students' lives when the program is implemented properly." While this requires appropriate assessment of individual student needs and significant time and preparation by dedicated staff, she says, "My biggest piece of advice is that it is worth the effort and resources."[76]

• • •

In the New York City public schools, 40 percent of students with IEPs—or more than 75,000 children—are classified as having a learning disability.[77] Learning disabilities are not homogenous, and therefore, there is no single intervention or remedial program that will always be the most effective in addressing the needs of *all* students with learning disabilities in reading. However, though interventions must be individualized—focused on a student's specific challenges and responsive to progress monitoring data—there are a number of over-arching principles:[78]

- Both *increased instructional time and smaller group size* are associated with gains for students with learning disabilities and provide the optimal conditions for success. One research review describes one-on-one tutoring as the "gold standard," and small group instruction (typically between two and five students) also has demonstrated effectiveness.[79]
- Instruction is *provided by skilled, highly trained teachers or reading specialists* who have expertise in the science of reading, the structure of language, and the nature of reading disabilities.
- Interventions are *implemented with fidelity*. As the New York State Education Department (NYSED) correctly notes in their guidance to districts on RtI, "a major factor involved with

unsuccessful interventions is a lack of or failure to implement the proposed intervention in the way it was intended."[80] Likewise, researchers stress that when implementing an evidence-based intervention, "it is important to remember that the intervention was shown to be effective under specific conditions"—which include the instructor's level of training, the frequency and length of teaching sessions, and the size of the instructional group—and therefore schools should "aim to emulate these conditions as far as is practicable in order to replicate success."[81]

- Effective interventions for students with learning disabilities are characterized by *direct, highly explicit instruction* that provides deliberate, unambiguous, step-by-step explanations and teacher modeling.
- Instruction is *systematic and carefully sequenced*. Lessons have a consistent structure, complex tasks are broken down into their component parts, easier skills are taught before introducing exceptions and irregularities, and students reach mastery before moving on.
- Instruction is highly interactive and provides students with *extensive opportunities for practice, cumulative review, and immediate teacher feedback*. The smaller the group size and the greater the duration of the intervention, the more opportunities the student has to practice, ask questions, and receive positive and corrective feedback, and the more closely the teacher can monitor progress and tailor instruction to individual needs.

STUDENTS STRUGGLING WITH DECODING & FLUENCY

Dyslexia is a specific learning disability in reading characterized by difficulties with accurate and/or fluent word recognition, leading students to decode incorrectly and/or slowly and with great effort.[82] Dyslexia most commonly arises from deficits in phonological processing. In other words, individuals with dyslexia have difficulty breaking the words of spoken language into their component sounds and in mastering the relationships between those sounds and the letters and spelling patterns that represent them in written language. Students with dyslexia also often have deficits in orthographic processing, or memory for the symbols of language and what written words look like, in addition to or instead of deficits in phonological processing. As a result, they may be able to decode relatively accurately, but do so very slowly, because each time they come across a word, it is as though they are seeing that word for the first time. They have difficulty building a sight word vocabulary and need significantly more exposures to a word in order to store its letter sequence in memory and achieve the automatic recognition that characterizes fluent reading. One of the best predictors of dyslexia is a child's performance on "rapid automatic naming" tasks, or how quickly the child can name letters, colors, or objects. This is because students with learning disabilities typically have slower processing speed; it takes the brain longer to integrate visual and auditory processes and to retrieve verbal information stored in long-term memory. Such students may go unnoticed and not be appropriately identified as dyslexic in early elementary school, but their failure to achieve fluency results in increasing academic difficulty as they are expected to read and understand more difficult texts in all of their classes.

Brain imaging studies have shown that dyslexia has neurobiological origins, with brain activation patterns that indicate inefficiencies in the neural pathways used while reading. Dyslexia is *not* a

temporary delay in normal development or something a child will simply outgrow. However, research has also shown that these neural systems are malleable and respond to intervention, and thus decoding and word recognition are very teachable skills, even for students with severe dyslexia. Evidence-based instruction brings about changes in brain functioning and organization, resulting in activation patterns similar to those displayed by skilled readers. As Dr. Sally Shaywitz, co-director of the Yale Center for Dyslexia & Creativity, writes, "the brain can be rewired…struggling children can become skilled readers."[83]

Dyslexia is not a temporary delay in normal development or something a child will simply outgrow. However, research has shown that neural systems are malleable and respond to intervention, and thus decoding and word recognition are very teachable skills, even for students with severe dyslexia.

Prompt identification and intervention is critical. Longitudinal analyses have shown that the reading achievement gap between students with dyslexia and their non-dyslexic peers is already evident in first grade and typically endures over the course of a student's educational career. Interventions provided in the first two years of schooling (kindergarten and first grade) are more effective than those implemented in later years, when students have fallen more significantly behind and generally require much more substantial and intensive remediation. As researchers writing in the *Journal of Pediatrics* noted in November 2015, "If the persistent achievement gap between dyslexic and typical readers is to be narrowed, or even closed, reading interventions must be implemented early, when children are still developing the basic foundation for reading acquisition."[84] The brain is at its most malleable in early childhood; further development and maturation will leave neural circuits less easily adaptable, making change more difficult (though still very possible) the older a child gets. Early identification and intervention is also essential from a social-emotional perspective, before children become discouraged or disengage from school.[85]

Systematic, explicit phonemic awareness and phonics instruction—which directly teaches letter-sound relationships and the rules of language in a carefully sequenced manner and guides students in applying this knowledge to read unfamiliar words—is beneficial for teaching all children how to read. It is absolutely *essential* for students with dyslexia. Such instruction is a hallmark of what the International Dyslexia Association has termed "structured literacy."[86] Orthographic and morphological interventions, which focus on the visual symbols and units of meaning *within* words, are particularly effective for students with reading disabilities and

struggling adolescent readers. Fluency difficulties are more challenging to remediate than weaknesses in phonemic awareness and decoding, but repeated oral reading with teacher modeling, support, and feedback has shown positive results for students with dyslexia. Significant practice and repetition strengthen and reinforce the neural circuits that underlie reading, increasing the extent to which they are able to operate automatically.[87]

STUDENTS STRUGGLING WITH READING COMPREHENSION

Children with reading comprehension impairments—those who are able to decode text and read aloud fluently and accurately, but struggle to understand and remember what they have read—typically have weaknesses in language, word knowledge, verbal working memory, and higher-level processing skills, such as making inferences.[88] Effective interventions therefore address underlying language, vocabulary, and meta-cognitive skills. Some students with a diagnosis of dyslexia will struggle with language-learning and comprehension in addition to decoding; those students whose reading difficulties are limited to comprehension may be classified as having a learning disability with impairment in reading (without the specification of dyslexia) or a speech/language impairment. Studies also indicate that many children with autism spectrum disorders experience challenges with reading comprehension, even when they are highly proficient decoders.[89]

Interventions provided in the first two years of schooling are more effective than those implemented in later years, when students have fallen more significantly behind and generally require much more substantial and intensive remediation.

Students struggling with reading comprehension—those who qualify for special education services, regardless of classification, as well as low-achieving general education students—often have trouble actively probing and engaging with text. They thus need direct, explicit instruction in a variety of strategies that successful readers employ before, during, and after reading. Examples of such strategies include how to identify a passage's main idea and how to utilize knowledge of common text structures, such as compare and contrast, to guide understanding and connect concepts within the text to one another. In addition, interventions that provide training in visualization comprehension strategies and mental imagery—creating a picture in one's mind while reading text—have shown effectiveness in helping students with comprehension difficulties. Use of imagery strategies may help students compensate for

working memory limitations and better integrate information within the text. Similarly, research shows that students with learning disabilities and autism spectrum disorders often benefit from the use of graphic organizers, such as story maps and Venn diagrams, which provide a framework for identifying and organizing a text's important information and ideas in a visual manner.[90]

MULTISENSORY INSTRUCTION

Most programs with demonstrated effectiveness for students with learning disabilities in reading have a multisensory approach in addition to the aforementioned characteristics.[91] Multisensory instruction involves the simultaneous or sequential use of visual, auditory, and kinesthetic-tactile pathways to enhance memory and learning. Sight, sound, and touch/movement (e.g., tracing a letter in the air or manipulating sandpaper letters) are all used to build and strengthen the neural connections involved in reading, thereby cementing learning. Multisensory structured literacy approaches are often referred to as "Orton-Gillingham" or "Orton-Gillingham-based," as they incorporate theories and techniques for teaching struggling readers that were first described by the neuropsychiatrist Dr. Samuel Orton and the psychologist and educator Anna Gillingham in the early twentieth century. Reading Reform Foundation's approach, described in the preceding section on teacher preparation, is based on Orton-Gillingham principles. Well-known reading programs that are Orton-Gillingham-based include Wilson Reading System, mentioned in Shawn's story above, and The Spalding Method.

Implementing Orton-Gillingham-based instruction effectively and with fidelity requires significant training. The process of becoming a Level I Wilson–certified teacher, for example, includes an introductory three–day workshop, approximately 90 hours of instruction in an online course, and completion of a practicum (providing a student with at least 60 sessions of one-on-one remedial tutoring). Similarly, joining the Academy of Orton-Gillingham Practitioners and Educators at the classroom educator level requires 30 hours of coursework and an 8–month, 50–hour practicum; becoming a certified member of the Academy (the highest level) involves 160 hours of coursework and 300 practicum hours over the course of two years.[92]

LITERACY IN ACTION
Lindamood-Bell Learning Processes[93]

"[He's] been in school for a long time and nothing seemed to help him. At Lindamood-Bell he's been reading, he's been doing better. He does better in school and he's looking for a job in the construction world, where you have to read signs and everything, and so far he's been able to do that. He's also interested in getting his driver's license, and this reading has helped him to go through the driving manual, which he couldn't do before."

— Grandfather of a 17-year-old AFC client with dyslexia

Lindamood-Bell Learning Processes is a national private provider of reading and math tutoring for students with general learning difficulties or specific disabilities such as dyslexia, autism, or ADHD. Lindamood-Bell literacy instruction uses the Lindamood Phoneme Sequencing® (LiPS®), Seeing Stars®, and/or Visualizing and Verbalizing® programs, each of which targets a specific processing skill that underlies reading, using a multisensory approach. When used for intensive intervention, instruction takes place one-on-one or in small groups (five students or less), between one and four hours per day, depending on the level of need. Lindamood-Bell's approach to instruction is effective because it provides interactive, intensive, and explicit instruction targeted to an individual student's strengths and weaknesses, based on diagnostic testing and continual progress monitoring. In addition, highly trained specialists deliver all tutoring; becoming a clinician in a Lindamood-Bell Learning Center requires 80 hours of training and a three-month mentorship period.

Lindamood Phoneme Sequencing® (LiPS®)

WHO BENEFITS • Children who have weak phonemic awareness (difficulty distinguishing and manipulating the component sounds of spoken language). Weak phonemic awareness causes students to add, omit, substitute, and reverse sounds and letters within words.

HOW IT WORKS • This intervention develops awareness of individual speech sounds and the mouth movements that produce them. Students learn how to apply phonemic awareness skills to reading, spelling, and speech.

EVIDENCE OF EFFECTIVENESS • Independent research reviews conducted by the U.S. Department of Education Institute of Education Sciences have determined the program has positive effects on alphabetics and fluency.[94]

Seeing Stars®

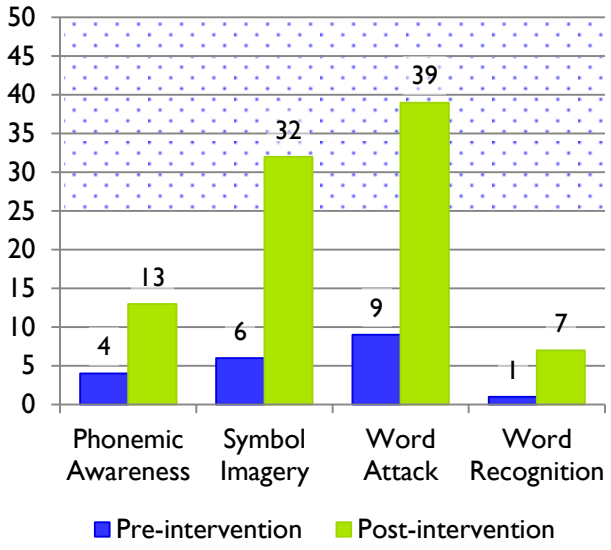
WHO BENEFITS • Students with weaknesses in orthographic processing (visualizing the letters making up a word and remembering the visual patterns of words). Such students have difficulty rapidly perceiving and connecting sounds to the letters that represent those sounds in print.

HOW IT WORKS • Seeing Stars helps students develop automaticity while reading. The intervention focuses on strengthening symbol imagery skills, beginning with the visualization of

individual letters and progressing to sight word development. It also provides instruction in morphology, teaching prefixes and suffixes as imaged "chunks" that ease decoding.

EVIDENCE OF EFFECTIVENESS • According to Lindamood-Bell's program analyses, students who receive Seeing Stars instruction make statistically significant gains in phonemic awareness, symbol imagery, decoding, and comprehension, as measured using a battery of standardized assessments.[95] For example, in New York City, a sample of 18 students for whom AFC obtained intensive tutoring using Seeing Stars between 2010 and 2015 experienced notable growth; pre- and post-test data show an average 30–point percentile increase in word attack skills, putting these students within the normal (25th–75th percentile) range following intervention (see figure 3).[96] In addition, independent researchers have concluded that students with dyslexia who receive Seeing Stars instruction make significant gains in decoding and fluency, and neuroimaging studies have demonstrated lasting structural changes in the brain following the intervention.[97]

FIGURE 3.
Average percentile scores of AFC clients on four reading skills, before and after tutoring.



Shaded area indicates normal range. Gains were measured using a battery of standardized reading assessments; see endnotes for more information.

Source: Analysis conducted by Lindamood-Bell Learning Processes for Advocates for Children of New York (November 2015). On file at AFC.

Visualizing and Verbalizing®

WHO BENEFITS • Students who struggle with reading comprehension.

HOW IT WORKS • This program develops students' ability to create mental imagery from language. Weak comprehension skills often result from difficulty in creating an imagined gestalt, or organizing what one has read or heard into a unified whole; such students are able to remember a few details or isolated facts from a text, but not the big picture. During Visualizing and Verbalizing instruction, teachers use questioning techniques to prompt students to picture and summarize what they see in their mind's eye when they read.

EVIDENCE OF EFFECTIVENESS • Once again, Lindamood-Bell's analyses demonstrate that students receiving this instruction make statistically significant gains on a variety of measures.[98] Further, a 2015 study conducted by independent researchers found that children with autism spectrum disorders who received 200 hours of Visualizing and Verbalizing instruction to remediate comprehension deficits displayed significant changes in brain functioning and enhanced connectivity between regions involved in language, which correlated with improved reading comprehension skills.[99]

While New York City students can access Lindamood-Bell instruction only by paying for the service or by obtaining an impartial hearing order requiring the DOE to pay, the company has effectively partnered with other school districts to provide direct instruction to students as well as training for teachers and staff. For example, in an urban district in Colorado that partnered with Lindamood-Bell from 1998 to 2003, students in grades 3–5 outperformed their peers in comparable Colorado schools on state-mandated reading comprehension assessments, and the extent of their gains increased over the years of the intervention. An independent analysis concluded that these improvements could not be attributed to other factors in participating schools and therefore represented a successful scale-up of the program.[100] The Washington, D.C. public schools, which serve a student population similar to New York City's, are currently collaborating with Lindamood-Bell to address the significant needs of their students with IEPs in pre-K through second grade. Through this partnership, struggling students at participating schools receive targeted small group or one-on-one instruction using the Seeing Stars and Visualizing & Verbalizing programs. After three years, anecdotal evidence indicates that many of these students are making dramatic gains, in some cases progressing to the point that they are ready to move from self-contained special education classrooms to more integrated settings. In addition to delivering student interventions, Lindamood-Bell experts are providing mentoring and instructional support for classroom teachers.[101]

Adolescents still struggling with foundational skills

"I wasn't passing any classes, and I want to be successful in life. It was just frustrating, and I just didn't want to go to school. School is about learning and teaching kids, and they weren't teaching me anything. I wasn't learning anything. Nobody seemed to care about me, so why would I want to go? I felt like I wasn't going to make it anywhere. It was really hard for me, knowing that I have a disability of learning, being in school and nobody helping me with anything. I'm supposed to be a senior thinking about going to college and I'm still in the ninth grade."

— 17-year-old ninth grader reading at a third-grade level

"I've done everything. I've done everything a parent is supposed to do. I had her in Early Intervention. I worked with her after school. I made sure that she did the work. And she doesn't have a behavior issue, she doesn't have attendance issues. So, like now she's 13 years old, I want her to be able to go to college. How can she ever go to college if she's not at grade level? How can she ever have a future without higher education?"

— Parent of a student with a learning disability five years behind in reading

Accelerating growth in reading in late elementary, middle, and high school is more difficult than in the early elementary grades.[102] However, though simply providing more of the same instruction as in the past will most likely not be helpful for those students still struggling with basic skills, it is *not* too late to intervene. Multiple meta-analyses of research have concluded that struggling older readers with and without diagnosed learning disabilities can improve on a variety of measures when provided with appropriate, evidence-based interventions.[103] Instruction for adolescents must be explicit, systematic, and matched to individual needs. It should be provided by expert teachers, involve high levels of teacher-student interaction and communication, and engage students in extensive guided and independent practice. In addition, in order for a student to maintain gains made and continue to progress, interventions may need to be sustained over a significant period of time.[104] When attempting to remediate deficits that have persisted past grade 3, researchers writing for the *Journal of Learning Disabilities* note that "progress is likely to be slow but steady."[105]

As discussed above, students who are not yet proficient decoders need explicit instruction in word analysis strategies, including morphology, etymology, and strategies for breaking apart multisyllabic words. With respect to fluency, guided repeated oral reading has demonstrated success in increasing reading rate and building a student's sight word vocabulary. For students struggling to understand what they read—the most common problem facing middle and high school students—research strongly supports explicit instruction in vocabulary and meta-cognitive comprehension strategies. Adolescents should learn, for example, how to activate past knowledge, ask questions while reading,

synthesize information from a variety of sources, and critically analyze an author's argument in order to gain deep understanding of what they read. Literacy instruction should not be limited to an English language arts course; rather, it should be embedded in content-area classes and occur throughout the school day. A science teacher, for example, would provide instruction in the unique features of scientific writing and discipline-specific strategies for effective comprehension of scientific texts.

Adolescent literacy instruction should not focus merely on isolated skill building; it should be relevant to students' lives and interests and facilitate the pulling together of all five components of reading. Students who have experienced years of frustration with reading typically have little motivation to read, and as researchers have noted, "an absence of motivation can have a spiraling and cyclical effect," as practice is required in order to improve.[106] The risk is high that middle and high school students will further disengage and solidify negative attitudes towards reading and school if instruction is dull, uses babyish texts intended for much younger children, or treats students as incompetent. Therefore, it is critical that struggling adolescent readers practice skills and strategies in meaningful contexts and have opportunities for authentic reading of engaging, relevant texts. Books should contain interesting, age-appropriate content *and* be at an appropriate level of difficulty, matched to a student's decoding ability.[107] Effective adolescent literacy programs also promote student engagement and self-efficacy, as older students face the additional challenge of "transform[ing] identities they may have constructed as nonreaders into new identities as more capable readers and learners."[108] Such instruction fosters student autonomy and motivation by allowing students to choose reading material based on their own interests, even if such material is not necessarily "academic" (e.g., popular magazines or comic books). Schools should seek to build supportive, nurturing learning environments in which students are encouraged to experiment and make mistakes as part of the learning process and to persevere in the face of difficulty. Collaborative and inquiry-based learning strategies, in which students work with their peers to solve a problem or discuss a topic, are particularly effective—provided all students are of similar age and reading ability—and allow for social interaction around reading.

Middle and high school students will further disengage and solidify negative attitudes towards reading and school if instruction is dull, uses babyish texts intended for much younger children, or treats students as incompetent.

Reading below grade level should not preclude adolescents and students with reading disabilities from accessing the general academic curriculum.

Importantly, reading below grade level should not preclude adolescents and students with reading disabilities from accessing the general academic curriculum. On the contrary, an inability to learn age- and grade-appropriate content will result in additional frustration and disengagement from school. Assistive technology (any technology that supports learning for an individual student with a disability, such as a laptop or communication device), alternative texts, and other accommodations can enable these students to access and demonstrate mastery of material that is at their intellectual level by providing alternative methods of task completion, information processing, and communication. For example, digital texts can be used in conjunction with screen reader or text-to-speech software that reads aloud with synchronized highlighting of the text. Use of such technology can allow a struggling reader to more easily acquire information and knowledge, as he or she can focus on the content to be learned instead of on slowly decoding individual words. Similarly, a student might listen to audiobooks in order to listen to fluent reading, build vocabulary, and access age-appropriate literature, while dictation software can help students who struggle with writing and spelling to express their ideas in print.[109]

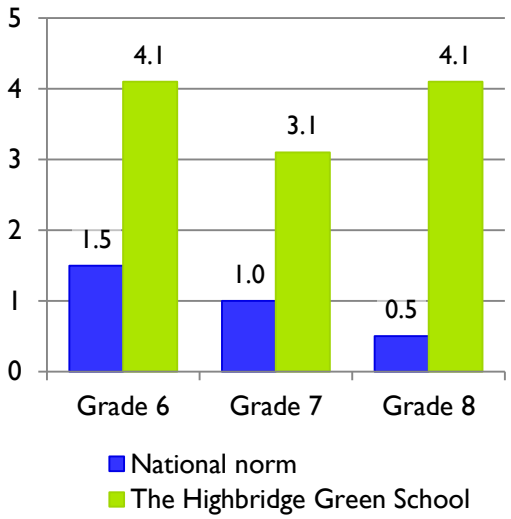
LITERACY IN ACTION
The Highbridge Green School

The Highbridge Green School, located in District 9 in the Bronx and serving grades 6–8, was founded in partnership with the community group United Parents of Highbridge and opened in 2013 as the neighborhood's first middle school. Over 95 percent of the school's students are economically disadvantaged, 99 percent are Black or Hispanic/Latino, 26 percent have disabilities, and 20 percent are English Language Learners.[110] Approximately 10 percent of Highbridge Green students are over-age for their grade, meaning they have been held back at least once, and about 80 percent enter middle school reading a year or more below grade level. The school has eight integrated co-teaching (ICT) classrooms (classrooms in which general and special education students are taught together by two full-time teachers, one of whom is a special educator), and its students with IEPs most commonly have a learning disability, speech/language impairment, emotional disability, or ADHD.

The Highbridge Green School is part of the DOE's Middle School Quality Initiative (MSQI), which provides middle schools with targeted funding and on-the-ground support, all specifically focused on improving reading achievement and preparing students for success in high school. MSQI's framework for school improvement is based on the Carnegie Corporation's *Reading Next* report, which laid out recommendations for improving adolescent literacy instruction and supporting older readers struggling with comprehension.[111] In the 2015-16 school year—MSQI's fifth year—more than 100 middle schools are participating in the initiative.

Though Highbridge Green students' state test scores remain low, given their initial reading levels and significant needs, internal progress monitoring data show enormous literacy growth. On the 2015 state ELA exam, for instance, the lowest-scoring third of Highbridge Green students outperformed approximately 75 percent of comparable City students (based on need and prior reading achievement). As measured by the

FIGURE 4.
Highbridge Green students' average growth on the Degrees of Reading Power (DRP) assessment, as measured by points gained, October 2015–February 2016.



Source: New York City Department of Education (DOE), MSQI Research and Evaluation, R. Cole, personal communication (2016, 2 March). On file at AFC.

Degrees of Reading Power (DRP) assessment, which provides progress monitoring data on reading comprehension, student growth dramatically surpasses national norms. Between October 2015 and February 2016, the average eighth grader at Highbridge Green made DRP gains eight times the national average (see figure 4).

UNIVERSAL SCREENING & PROGRESS MONITORING

MSQI staff help participating schools build their internal capacity to assess student learning, screen for reading difficulties, and thus match struggling students with appropriate interventions. At the start of the school year, Highbridge Green conducts universal diagnostic assessments to determine each student's strengths and weaknesses with respect to decoding, fluency, and comprehension. Every student then has a one-on-one conference with their teacher, at which they discuss their current reading levels and what they need to work on and set an individual reading goal for the year. Because so many Highbridge Green students enter middle school significantly behind, often these goals involve making two years of growth in reading over the course of a single academic year.

FAMILY ENGAGEMENT

Each Highbridge Green student's assessment data and personal "reading plan" (created at the student-teacher conference) is shared and discussed with his or her family. Teachers conduct home visits for every sixth grader, at which they provide parents with a toolkit and build their capacity to support their child's reading at home. Students with IEPs and the most significant reading difficulties are front-loaded in the home-visiting schedule. Furthermore, because low-income students are at risk for summer learning loss and may not have many books at home, through MSQI's summer reading initiative, students receive either several books of their own choosing or iPads loaded with e-books to read over the summer. When we visited at the start of the 2015-16 school year, we met one student who spent so much time reading his e-books, he not only maintained his progress from the prior year, but actually *gained* ground over the summer months.

A SCHOOL-WIDE COMMITMENT & LITERACY ACROSS THE CONTENT AREAS

The Highbridge Green School is highly committed to building a culture of reading; in addition to strong school leadership, *all* teachers, regardless of subject area, are involved in literacy learning. This school-wide focus on literacy and shared responsibility for student progress is instrumental for success with a high-needs population. At MSQI schools like Highbridge Green, literacy instruction is not confined to an English Language Arts class; rather, it is infused throughout the school day and across the curriculum.

MSQI schools use the research-based program WordGen Weekly, which was developed by literacy experts at the Harvard Graduate School of Education in conjunction with the Boston Public Schools. Early experimental studies have found WordGen to be effective in improving students' vocabulary knowledge and reading comprehension skills, with especially large growth for ELLs.[112]

WordGen is a whole-school curriculum that teaches five high-leverage, cross-disciplinary academic vocabulary words (e.g., *phenomenon, stigmatize, incentive*) per week. The program emphasizes critical thinking, reasoning, and the deep learning of new vocabulary that is essential for reading comprehension; focus words typically have multiple meanings based on context and/or lend themselves to word study lessons that explicitly teach morphology and etymology (e.g., identifying Greek and Latin roots). Each week's words are thematically linked, grouped around a topical question or social issue (e.g., *"Should English be the official language of the United States?").* Research shows that students best learn new vocabulary words by repeatedly engaging with them in a variety of semantically-rich contexts, and so WordGen words are reinforced across the curriculum over the course of the week. After direct, explicit teaching of the meanings of vocabulary words in ELA class on Monday, students are exposed to those same words in word problems in Tuesday's math class and in a short activity in science class on Wednesday. On Thursday, students discuss and debate the week's question in social studies class—again emphasizing use of the week's five vocabulary words—and then write persuasive essays on the topic in Friday's ELA class.

Select Highbridge Green students also participate in citywide Saturday debate tournaments, which are hosted four times a year by MSQI in partnership with the NYC Urban Debate League. Debate questions are drawn from the WordGen curriculum, and student teams research the issue, develop an argument, and compete against students from other MSQI schools for individual, team, and school awards. MSQI has found the debate program very effective in boosting student engagement, and participating students' rate of growth in reading comprehension has outpaced that of comparable MSQI students not in debate. Similarly, a study of Chicago Public Schools students found that participation in a competitive debate league improved reading achievement and increased the likelihood of graduating high school and meeting college-readiness benchmarks, especially for Black males, even after controlling for self-selection into the program.[113]

STRATEGIC READING TUTORING

All students at MSQI schools like Highbridge Green receive targeted, small-group reading instruction, which is built into the school day as a flexible strategic reading period. Structuring the day to include this second literacy block in addition to the Common Core-aligned literacy curriculum allows students to receive interventions without being pulled out of subject-area instruction and to easily move between instructional groups based on individual needs and progress monitoring data. During the strategic reading period, students engage in independent reading with self-selected books at their own level and regularly conference with their teacher about their individual progress, with the goal of developing each student's identity as an independent reader. Because struggling adolescents have likely had negative experiences with reading in the past, this also involves supporting students socially and emotionally. When we observed a strategic reading period at Highbridge Green, a teacher noted to us that a particular student (who was clearly upset and was sitting with a book open, but not actually reading it) was "having some feelings about reading right now;" the teacher was encouraging the student to privately write down what she was feeling and why she didn't want to read.

DOE staff help each MSQI school decide which interventions are most appropriate for their population, and students are matched to interventions based on their individual needs. At Highbridge Green, three teachers are Wilson-certified and provide remedial instruction in decoding using Wilson's Just Words®, a tier 2 intervention for grades 4–12, as well as via the more intensive Wilson Reading System® (described in the previous section on learning disabilities). All students receive explicit instruction in reading comprehension strategies, and through guided reading and reciprocal teaching, learn how to apply a range of strategies employed by skilled readers. Reciprocal teaching is a research-based instructional approach in which students engage in structured, small group peer-to-peer dialogue about a text. Students read and construct meaning together by making predictions, asking questions, clarifying points of confusion, and summarizing what has been read; this structure gives students a transferable framework for actively thinking about what they read and self-monitoring for understanding.[114] This year, Highbridge Green is also piloting the Strategic Adolescent Reading Intervention (STARI), a tier 2 intervention designed specifically for students in grades 6–8 who are reading two or more years below grade level. STARI, which also emphasizes student discussion and uses reciprocal teaching, targets primarily fluency and comprehension and centers around the reading of novels and nonfiction books grouped into thematic units (e.g., bullying and self-confidence).

CONTINUOUS COLLABORATION & PROFESSIONAL DEVELOPMENT

Much like at P.S. 112 (see pages 18-19), MSQI schools like Highbridge Green strive to have a culture of learning and collaboration amongst teaching staff. Every week, teachers have dedicated time during the school day to meet in grade-level teams, coordinate instruction across content areas, share ideas and collaborate on lesson plans, and learn from one another. DOE coaches also provide on-the-ground training and support for teachers and administrators. Middle school educators trained as science, math, or social studies teachers typically do not receive much, if any, pre-service training in the teaching of literacy, and so MSQI provides toolkits, resources, and professional development to help teachers learn how to teach vocabulary, comprehension strategies, and disciplinary literacy across content areas.

LITERACY IN ACTION
Brooklyn Frontiers High School

Brooklyn Frontiers High School, which opened in 2011, is a small public high school in downtown Brooklyn that exclusively serves high-needs, over-age students at risk of dropping out. The school partners with Good Shepherd Services to provide students with holistic services and social-emotional supports; each student is matched with a dedicated "coach" who guides them in achieving their academic and personal goals. To be admitted to Brooklyn Frontiers, students must be first-time ninth graders who were held over twice in elementary or middle school. Ninety-eight percent of the student population is Black or Hispanic/Latino, 83 percent qualify for free or reduced price lunch, and 48 percent of students have disabilities, the majority of whom are classified as having a learning disability or speech/language impairment.[115]

Brooklyn Frontiers has a particularly high population of students reading significantly below grade level, and all new students complete a diagnostic assessment following their acceptance in order to determine their specific needs and an appropriate class placement. As described previously, most curricula for struggling readers target elementary school students and thus include content of interest to that age group. As a result, struggling adolescent readers—who often already have negative feelings about school—find the curriculum insulting and quickly disengage, as was the case with the first interventions Brooklyn Frontiers tried. The school now offers significant literacy support and remediation that staff has specifically designed to be age-appropriate.

Students who arrive at Brooklyn Frontiers exhibiting low decoding skills take a credit-granting class called Linguistics, which uses the programs Phonics Blitz™ and Phonics Boost™ for explicit, systematic instruction in phonemic awareness, phonics, and morphology. Both programs, designed by the company Really Great Reading®, cover the same material and are differentiated by the pacing of instruction; Boost is designed for students who have more severe deficits and need more practice and repetition in order to make gains. Blitz and Boost use an Orton-Gillingham-based multisensory approach and are specifically designed to provide intensive remediation to middle and high schoolers who have not mastered basic decoding skills. The programs thus use more challenging vocabulary than interventions developed for younger children, and they emphasize academic language, making instruction relevant to content-area coursework.

Brooklyn Frontiers' Linguistics course also provides instruction in the structure of language using sophisticated terminology (e.g., digraph), so that students are not just receiving remediation similar to what they may have experienced in earlier grades, but are actually learning new, more advanced linguistics concepts that their peers are not. For example, when we visited in spring 2015, we observed a morphology lesson in which the class broke apart *pneumonoultramicroscopicsilicovolcanokoniosis,* the longest word in the English language, to deduce its meaning based on its component parts. Class

size is kept small, about ten students, allowing for individualized attention and support. On the day we visited, the special education teacher made use of instructional technology to keep the class engaged, with each student using the classroom smartboard to physically manipulate letter tiles to practice and review phonics skills. When implementing Blitz or Boost, student progress is assessed every few weeks. While the progress monitoring data set from Brooklyn Frontiers is too small to draw meaningful quantitative conclusions while preserving student confidentiality, teachers at the school report that students whose deficits stem primarily from a history of inadequate instruction in foundational skills often demonstrate remarkable gains in a short period of time, and addressing these students' gaps in basic skills translates to improved fluency and reading comprehension.

Since Blitz and Boost focus only on decoding skills, Brooklyn Frontiers supplements this intervention with internally-developed instruction focused on reading comprehension. Many of the school's students have large gaps in vocabulary and content knowledge, and so the teaching staff tries to build such background while also providing instruction in specific comprehension strategies. In all ELA courses, class size is kept small and coursework is designed to be age-appropriate, so that students are not stuck with immature, uninteresting texts simply because they are reading below grade level. For example, we observed a class that was studying Geoffrey Canada's autobiography, *Fist Stick Knife Gun: A Personal History of Violence,* using the book's graphic novel adaptation, which presents the same content in a different, more easily accessible manner.

Students with significant cognitive disabilities

"I really wanted some concentration on the reading, writing, and arithmetic, just the basic regimen. I feel that she's capable of learning those things. I kept getting these reports that she's a good girl, that she's neat and clean, and she's amicable. She already had a label but if they think that she's [able to work] and she can function [independently], then I think that she deserves the right to learn how to read and write. You get tired of hearing that your daughter is nice and likeable, but they don't want to give her the time during the school day to educate her."

— Parent of a high schooler with an intellectual disability

Students with significant cognitive disabilities have typically received only minimal literacy instruction, and the instruction they have received has primarily focused on teaching sight words in the context of functional daily living activities, such as grocery shopping and meal preparation. More often than not, this population has not been given the opportunity to learn the foundational skills that underlie real reading—decoding unfamiliar words using knowledge of sound-symbol correspondences and thereby gaining meaning from text. Functional sight word instruction that promotes maximal independence in adulthood is certainly beneficial, particularly for students approaching the transition out of high school, and research has demonstrated that even students with severe intellectual disabilities can learn sight words via systematic prompting techniques. However, this is not a reason to exclude students from comprehensive literacy instruction altogether from the earliest years of schooling, as has historically been the case. As one review of research published in *Exceptional Children* noted, "students with significant cognitive disabilities may not have learned to read in the past because they were either not taught to read or were not taught with methods that promote literacy."[116] Similarly, teacher preparation programs for special educators typically provide little to no training in providing literacy instruction to this population.[117]

Assuming from the outset that certain students cannot learn to read due to the nature or severity of their disability severely limits their future opportunities and quality of life. Improving outcomes for such students will require making reading an instructional priority and providing every student with the opportunity to learn to read, as experts in the field argue that "the only way to determine who can learn to read is through teaching reading skills."[118] Some researchers have found, for instance, that IQ does not necessarily predict a student's rate of growth or response to intervention, with students with lower IQ scores progressing more rapidly than those scoring in the mild or borderline range.[119]

Assuming from the outset that certain students cannot learn to read due to the nature or severity of their disability severely limits their future opportunities and quality of life. Improving outcomes for such students will require making reading an instructional priority and providing every student with the opportunity to learn to read.

While the research base on teaching phonemic awareness, phonics, fluency, vocabulary, and comprehension to students with significant cognitive disabilities is not as extensive as for other populations, recent studies have found that students with intellectual disabilities can learn to read via the same instructional methods that have proven successful for struggling readers with average-to-high IQs.[120] Because students with intellectual disabilities are highly diverse with respect to their specific needs and learning styles, instruction for this population requires a high level of individualization. Children with intellectual disabilities often have memory deficits and difficulty retaining, integrating, and applying learned skills in new contexts. Thus, instruction must explicitly teach how to transfer skills to new activities and relate skills to word meanings, for example, by using picture cards or visual props in conjunction with phonemic awareness and phonics instruction. Children with attentional or behavioral challenges will additionally require significant reinforcement and positive behavioral supports to stay on task and fully participate in lessons. Though it may take students with significant disabilities much longer to fully master skills, with intensive, structured, evidence-based instruction delivered by a skilled teacher, students are able to apply phonemic awareness and phonics skills to decode and gain meaning from unfamiliar text.

The general principles of explicit phonemic awareness and phonics instruction described previously are all still applicable for students with significant disabilities. Students learn letter-sound correspondences when they are taught in a structured, carefully sequenced manner, with easier and more common sounds for individual letters taught first, gradually building to more difficult sounds and patterns. To reach mastery, students with intellectual disabilities will most likely need more intensive instruction that continues further into the primary grades and that includes extensive scaffolding, practice, and cumulative review. Children with communication challenges will also need alternative methods of responding in such activities, such as pointing to printed letters or picture cards. For example, instead of prompting verbal articulation of the phoneme /d/ by asking, "What sound do *dog* and *doll* both start with?" the teacher might display a selection of pictures, one of which is a doll, and ask,

"What other word begins with the same sound that *dog* starts with?"[121]

As is the case for all children, oral language, vocabulary, and background knowledge form the foundation for skilled reading and understanding for children with significant cognitive disabilities. Thus, regardless of disability status, students should have opportunities from the beginning of schooling to develop listening comprehension skills and networks of knowledge about the world, through activities such as storybook read-alouds and meaningful conversations with adults. With respect to explicit vocabulary instruction, teachers might use pictures, videos, or physical gestures to help illustrate the meanings of new words. Once again, children with significant needs may need alternative methods of responding, such as using pointing or thumbs-up/thumbs-down signaling to illustrate understanding of vocabulary words in context. Finally, as is true for students with learning disabilities in reading, students with significant cognitive disabilities can benefit from use of assistive technology and alternative texts, which allow access to interesting, age-appropriate books.[122]

Students with intellectual disabilities can learn to read via the same instructional methods that have proven successful for struggling readers with average-to-high IQs.

LITERACY IN ACTION
Structured Methods in Language Education (SMILE) in District 75

"SMILE helped me read. If you do SMILE every day, it might help kids to read too."
— Luis, a sixth grader attending a District 75 school in the Bronx

"I like to read. I'm happy [my teacher] is helping me learn to read."
— High school student, P.S. 79M Dr. Edmund Horan School

Structured Methods in Language Education (SMILE) is a beginning reading program developed specifically for students with the most significant language-learning, communication, and literacy needs, including students with intellectual disabilities, autism spectrum disorders, hearing impairments, and traumatic brain injuries. Any student who is able to attend to instruction (e.g., make eye contact) and who has mastered fewer than ten phonemes is a candidate for SMILE's methodology. Notably, one of the program's core principles is: "Never assume a student cannot learn to speak or read no matter how severe a disability they may have."[123]

SMILE was developed by Dr. Enid Wolf-Schein, a speech-language pathologist, based on instructional approaches effective with deaf and hearing impaired children. In New York City, SMILE was first piloted with students with autism and limited verbal skills in ten District 75 schools during the 2008-09 school year. (District 75, the citywide special education district, serves students with significant disabilities who need intensive, specialized support.) Pre- and post-intervention testing showed students in the pilot program made significant improvements in foundational skills: prior to SMILE, students' average word-reading score was 20 percent; at the end of the year-long intervention, the average score was 64 percent.

Special education teachers, speech therapists, and paraprofessionals are currently providing SMILE instruction in more than 50 District 75 schools—including elementary, middle, and high schools—located in all five boroughs. We observed SMILE in action at P.S. 79M Dr. Edmund Horan School, a District 75 high school located in Harlem. The Horan School has seen a number of their students—including students who are nonverbal—make significant progress with SMILE, and additional members of the staff are in the process of being trained in the methodology. We were told that a 16-year-old student who greeted us with "good morning," for instance, communicated exclusively with grunts prior to her participation in the program.

SMILE teaches decoding skills in a highly structured, systematic, explicit, and multisensory manner. Instruction is sequenced and cumulative, following a linguistically logical order. These elements are all essential to success for this population. SMILE is delivered one-on-one, typically via push-in or pull-out support, in daily sessions of 10–15 minutes. Keeping lessons short helps students stay

focused and engaged, an important consideration for students with significant behavioral needs or difficulties with attention. This also allows for frequent repetition; reinforcement activities can occur in different contexts over the course of the school day. The two students we observed at The Horan School, for instance, needed occasional redirection, but overall stayed attentive, seated, and engaged in SMILE activities (despite both the presence of an audience and the distraction of other instruction taking place in the classroom).

The program starts by building students' attention and imitation skills in nonverbal activities, such as clapping hands or tracing a line with a crayon. Individual sounds are then taught using those attention and imitation skills, beginning with the most common phonemes; the first four sounds in SMILE's instructional sequence are /p/, /o/, /m/, and /ē/. Activities pair phonemes with the letters that represent them in print, but instruction only teaches letter *sounds*, never letter *names*, as sounds are the significant element in learning to decode. This prevents unnecessary confusion. In addition, early on in instruction, SMILE only uses lowercase letters, never uppercase. (As students progress through SMILE's instructional modules, uppercase lettering is introduced as students learn to apply letter-sound relationships to read and write sentences.) New phonemes are always introduced using the following six-step method, which ensures a consistent lesson structure, provides extensive opportunities for review, integrates visual, auditory, and kinesthetic processing, and supports students' ability to generalize new skills (rather than developing skills in isolation):

- The teacher articulates the sound, without showing its representation in print, and the student repeats it.
- The student *traces* the letter that represents the sound five times, using five different colors, then vocalizes the sound.
- The student *copies* the letter that represents the sound five times, again using five different colors, and vocalizes the sound again.
- The student *reads* the sound aloud when shown it in print.
- The teacher articulates the sound, and the student *writes* it from memory.
- The student practices sound discrimination, pointing to the correct letter when the teacher articulates the phoneme. Successful completion of this step three out of five times indicates the student has mastered the sound and is ready to move on to the next in the sequence.

After mastering a given set of sounds, students practice "drop drills," which combine previously learned sounds into syllables. These consonant-vowel combinations are repeated three times and written in a descending "staircase" as students articulate the sounds individually. Each sound is written in a different color to reinforce the component phonemes. For example, the drop drills taught after the first four phonemes are:

po mo pee mee
po mo pee mee
po mo pee mee

Teachers next introduce one-syllable words composed of two previously learned phonemes (e.g., *bee* after students have mastered /b/ and /ē/) in a sequence known as "cross drills." A cross drill allows the student to apply letter-sound associations to unknown words. Students learn how to blend the phonemes they have learned to form words to which they can attach meaning. The first words students learn are all simple nouns that can be matched with pictures or objects, thus aiding understanding (e.g., *bee* is immediately associated with a picture of a bumblebee). As students are introduced to and master additional sounds, they progress to one-syllable words that combine three phonemes (e.g., *beet* after /t/ is added to a student's list of learned sounds) and gradually build to multi-syllable words of increasing complexity as they learn how to apply their knowledge of phonics. Later on in instruction, learned words are combined into simple sentences and stories, which will always contain only those letter-sound relationships that the student has already mastered. As students progress incrementally through all 44 phonemes and learn how to build words from individual sounds, lessons have a consistent structure and there are regular opportunities for practice and review, as is essential for students with significant disabilities.

While growth requires time, patience, and persistence, SMILE instructors at The Horan School have found the highly structured nature of the program to be very effective. One of the school's teachers says of a student, "With each new sound and new word, David is transforming from an emerging reader to a more confident reader;" another describes SMILE as "like the beginning of spring," as her student is "blossoming" in the program.

Recommendations

At the end of eighth grade, 14-year-old Kalilah—who has a learning disability and language impairment—was reading on a second-to-third grade level. Kalilah had been receiving services for her disabilities since she was a toddler, but continued to struggle in her public school classrooms, especially with reading and writing. Moreover, by middle school, her academic difficulties were significantly affecting her self-esteem and emotional well-being. Kalilah hated school, would sometimes cry in class, and was teased by her peers because of her reading difficulties. A comprehensive evaluation conducted in the spring of eighth grade revealed that, though she unquestionably had the potential to learn, Kalilah's foundational skills were severely delayed; she scored in the first percentile or below (i.e., lower than 99 percent of students her age) on measures of phonological processing and decoding. With this evaluation in hand, Advocates for Children helped Kalilah's mother navigate the system and advocated strongly on her behalf to secure an appropriate high school placement and intensive reading remediation. In fall 2015, Kalilah started ninth grade at a private special education school, paid for by the DOE, where she is receiving Orton-Gillingham-based reading instruction and benefiting from the use of assistive technology (a laptop and text-to-speech software). With appropriate, individualized instruction, Kalilah is finally making progress. Her mom reports, "It was very frustrating that she wasn't getting the help she needed. Now, everything is so great. She's joined a newspaper club! She never would've done that before because it's all reading and writing. She's on honor roll now, too. Her reading and writing are so much better. [Last year,] she didn't want to go to school and used to ask me all the time if she could stay home. That never happens now. She's excited to go every day."

• • •

The ability to read—to gain knowledge and draw meaning from a wide variety of texts—is essential for success in school, adult independence, and employment in the twenty-first century economy. In this paper, we have briefly summarized the essential components of literacy instruction from pre-K through twelfth grade, with a focus on struggling readers and students with a range of disabilities. Neuroscience research has unambiguously demonstrated that learning to read is a highly complex process, not a skill that all children will acquire naturally or without effort. Most children, with and without disabilities, need direct instruction in the five pillars laid out by the National Reading Panel: phonemic awareness, phonics, fluency, vocabulary, and reading comprehension. As the Committee on Preventing Reading Difficulties in Young Children noted more than 15 years ago, "Prevention efforts must reach all children. To wait to initiate treatment until the child has been diagnosed with a specific disability is too late."[124] We believe that all New York City children would benefit from age-appropriate classroom teaching that is explicit, systematic, carefully sequenced, and firmly grounded in the science of reading. In addition, it should take place within an RtI framework that quickly identifies and provides targeted support for struggling students, before they begin to fall further and further behind.

While literacy rates are currently abysmal for low-income students generally and students with disabilities especially, we emphasize that this is *not* an unsolvable or hopeless problem. There is a strong scientific consensus on how the brain learns to read, why some children have difficulties, and

how we can best teach them in the way that they learn. With very rare exceptions, all children—including those with severe dyslexia, intellectual disabilities, and other significant needs—can and do learn to read when they receive appropriate, intensive, evidence-based instruction. Improving the literacy skills of *all* New York City public school students, with and without disabilities, will require ongoing, coordinated commitment and investment of resources at the classroom, school, district, and citywide levels. Because reading is so complex and children's needs so varied, no one methodology or intervention will work for every student and no isolated workshop will provide teachers with the expertise and support they need to be successful in the critical task before them. There is no quick fix. We commend Mayor de Blasio and Chancellor Fariña's universal second grade literacy initiative, which will, over time, provide every elementary school with a specialized, highly trained reading coach who can support K–2 classroom teachers. New York City must expand upon this initial goal in order to make literacy for all a reality. Students like Kalilah should not have to struggle for years without receiving help or travel to a private school far from their home because the DOE is unable to meet their needs. Only with long-term commitment and resources from those in positions of leadership at City Hall and the Department of Education will success be possible and sustainable across the City's schools.

RECOMMENDATION 1
Develop a comprehensive, multi-year plan for meeting the literacy needs of *all* students.

While the need to improve literacy rates is immediate, we recognize that there are concerns and challenges in quickly scaling up expertise and support in a system with 1,800 schools. We therefore support the DOE's decision to begin this work in the elementary grades and in targeted districts with particularly high needs, starting with approximately 100 schools in 2016-17. However, the DOE must also develop and publicly share a *comprehensive*, *long-term* action plan for meeting the literacy needs of *all* students, with and without disabilities, from pre-K through the end of high school. In creating such a plan, the DOE should:

- *Assess the system's current capacity* to provide evidence-based literacy instruction and intensive interventions to students, including those with a range of disabilities, at all grade levels. Identify existing strengths, barriers, and resource needs.
- *Consult with experts* in the field, including both academic researchers and on-the-ground practitioners, regarding best practices at every grade level. Solicit feedback from parents (including parents of children with disabilities and ELLs), students, teachers, principals, and other school staff as to their experiences with literacy instruction. Find out from these key stakeholders what they see as the most pressing needs and what could make a difference in their own schools.
- *Ensure structures are in place to support effective, meaningful collaboration* between the DOE's Division of Teaching and Learning, which is responsible for RtI and academic intervention services, the Division of Specialized Instruction and Student Support, which addresses special

education, and the Division of School Support, which oversees the district superintendents. Staff located in a number of DOE offices and focused on a range of general and special education initiatives—from early childhood education to Renewal schools to specialized programs in District 75—are involved in efforts around literacy, and all of this work must be coordinated system-wide.

- *Articulate specific goals*, with a timeline and budgetary needs for meeting them, benchmarks for evaluating progress, and mechanisms for oversight and evaluation. Articulate a plan for ensuring progress is sustainable and for building the infrastructure necessary to withstand staff turnover and changes in school and district leadership.

RECOMMENDATION 2
Prepare and support classroom teachers.

As discussed previously in this paper, teaching reading requires significant, specialized expertise; it is not enough for teachers simply to be skilled readers themselves. Rather, they need direct training and ongoing, at-the-elbow support in using evidence-based teaching strategies and in making instructional decisions based on the strengths and needs of their individual students. As the aptly titled paper *Teaching Reading IS Rocket Science* noted in 1999, "Just about all children can be taught to read and deserve no less from their teachers. Teachers, in turn, deserve no less than the knowledge, skills, and supported practice that will enable their teaching to succeed."[125]

2A • PRE-SERVICE TRAINING

Colleges, universities, and other teacher certification programs across New York State must prepare all new teachers to teach reading effectively, so that no new teacher is forced to figure it out on his or her own. Pre-service teachers—not just individuals seeking additional, advanced certification as reading specialists—should be required to complete foundational coursework in the science of reading and acquire on-the-ground experience specifically focused on teaching each of the five pillars. Training should reflect the needs of the population the teacher candidate seeks to serve; a future middle or high school science teacher, for example, needs to understand both the overall process of reading development and how to incorporate adolescent literacy instruction into their discipline. The Board of Regents, the New York State Education Department (NYSED), and the DOE should incentivize the improvement of teacher preparation programs, create explicit partnerships with teaching colleges with the aim of training highly skilled general and special education teachers of reading, and give teacher candidates who have this expertise and experience priority in the hiring process.

2B • ONGOING PROFESSIONAL LEARNING

To ensure that teachers currently in the classroom are well-prepared and well-supported in their jobs, the DOE must provide high-quality, continuous professional development for *all* educators. Specifically, the DOE should:

- *Provide in-service training that is deliberate, consistent, and ongoing.* While elementary school is the logical place to begin this work, ongoing training and support should be available to general and special education teachers of all grade levels and all subject areas. It is not sufficient to offer teachers or other school staff a handful of workshops and then expect them to continue on their own or rely on Internet resources for support. Rather, teachers need real-time coaching, supportive feedback, and time for learning and collaboration with their peers in order to be able to integrate new knowledge and teaching strategies into their practice.
- *Ensure training is responsive to teacher and school needs.* Professional development should target a school's specific challenges while building on existing strengths; for example, a particular school might provide excellent vocabulary instruction but struggle with implementing a phonics program that meets the needs of their students. As with pre-service teacher training, professional development should recognize the unique challenges of specific ages and populations. A pre-K teacher needs different training than a teacher at a middle school with a disproportionately large number of over-age students, for instance, as unique skill sets are needed for teaching emergent literacy in the early childhood classroom versus teaching disciplinary literacy and reading comprehension to students who have likely experienced years of difficulties with reading.

RECOMMENDATION 3
Build literacy expertise and capacity to provide evidence-based interventions in every school.

Every New York City public school—including pre-K programs, elementary, middle, and high schools, District 75 schools, and District 79 programs—needs to have *at least* one staff member who has deep, specialized expertise in literacy instruction for students with and without disabilities. This literacy expert must have sufficient time, without neglecting other job responsibilities, to (a) share their specialized expertise widely throughout the school, serving as a point person for teachers working with struggling readers and supporting general classroom instruction; *and* (b) work with individual students who need intensive, targeted interventions. The DOE's current second grade literacy initiative aims to improve schools' core reading programs and provide instructional coaching for teachers, a critical goal. In addition, every child struggling with reading and in need of extra help—regardless of the school they attend or their disability status—should have timely access to targeted, evidence-based intervention, provided individually or in small groups by an expert teacher who has the ability to draw on a toolkit of best practices to meet a range of student needs. As Dr. Maryanne Wolf writes, "It is vital…to ensure that all children with any form of reading problem receive immediate, intensive intervention…A comprehensive support system should be in place from the first indication of difficulty until the child becomes an independent, fluent reader."[126] This will require building schools' capacity to fully and effectively implement RtI, as well as oversight to ensure that interventions are being implemented with fidelity and that staff time is being used appropriately. Some struggling schools may need multiple dedicated literacy specialists in order to adequately meet their students' needs and make meaningful progress.

RECOMMENDATION 4
Use technology to support instruction.

The DOE should use technology to help struggling readers and students with disabilities access age-appropriate, grade-level academic material, even if they are reading below grade level. This includes:

- *Improving the way that Assistive Technology (AT) is accessed, supported, and funded* and eliminating barriers that prevent individual students from benefitting from AT. Under federal and state law, the DOE is responsible for providing AT to students with disabilities, at no cost, if evaluation demonstrates that AT would be appropriate to help the student progress.
- *Ensuring schools have access to instructional technology*—computers, tablets, smartboards, etc.—*and training teachers in how to use this technology effectively* to support their practice and benefit a wide range of students in the classroom. When used well, technology can increase access to and engagement in lessons and supporting activities.
- *Offering opportunities for students to engage with text in a variety of ways, using Accessible Educational Materials (AEM)*. Text should be available in hard copy, electronically, through spoken word, and in multiple fonts and formats. Individual teachers cannot take on the work of adapting text for individual classroom use on their own time and should not be expected to do so. Instead, the DOE should commit to purchasing and developing curricula that are readily adapted from the start, thus shifting the burden from teachers to curriculum distributors and developers.

RECOMMENDATION 5
Improve communication with families to promote literacy.

To implement the above recommendations effectively, the DOE must embrace families as genuine partners and be responsive to parent concerns with respect to reading. Schools and teachers should engage in ongoing, meaningful dialogue with families about their children's needs and progress, and parents should be able to consult with their school's literacy coach when they have concerns or questions. Further, the DOE needs to provide parents—including those who themselves have low literacy levels or limited proficiency in English—with the tools and information they need to monitor their children's progress and support instruction outside of school. Parents need accessible, jargon-free explanations of what their children should be learning, what they should expect to see as developmental milestones with respect to literacy, how to recognize common manifestations of learning disabilities such as dyslexia, how to access evaluations and interventions from the DOE to help their children learn to read, and what strategies reinforce literacy learning at home.

GLOSSARY OF TERMS

Accessible Educational Materials (AEM) are instructional materials that are designed to be useable across a range of formats (large print, digital text, audio, Braille, etc.) to meet the needs of students with a range of disabilities. For example, digital text can be easily enlarged, converted to a different font, or used with screen reader software.

The **alphabetic principle** is the idea that written language is a code in which graphemes represent phonemes; in other words, the letters of written text correspond with units of sound in spoken words in predictable ways.

Assistive Technology (AT) is defined by the Individuals with Disabilities Education Act (IDEA) as "any item, piece of equipment, or product system, whether acquired commercially off the shelf, modified, or customized, that is used to increase, maintain, or improve functional capabilities of a child with a disability" [20 U.S.C. § 1401(1)(A)]. There are forms of AT designed for a variety of learning and developmental challenges. Examples include, but are not limited to: computers, iPads, and keyboarding devices; writing aids, such as pencil grips and smart pens; alternative augmentative communication (AAC) devices; and environmental control units, such as switches and joysticks.

Decoding (also called "sounding out" or "word attack") refers to the process of deriving the pronunciation of a word based on knowledge of letter-sound associations—in other words, transforming written language into speech.

Etymology is the study of word origins and derivations: the history of where words and their component parts come from, how word meanings and forms evolve over time, and the relationships between languages.

Fluency is the ability to read text accurately, effortlessly, and with appropriate speed and expression. Fluent readers automatically recognize known words and their oral reading sounds smooth and natural. The underlying processes of reading have become unconscious and automatic, allowing the reader to devote attention to gaining meaning from text, rather than to decoding individual words.

Graphemes are the printed symbols that represent the sounds of oral language; they can consist of one letter or combinations of letters. For example, the /k/ sound can be represented by graphemes such as K (as in *kite*), C (as in *cat*), CK (as in *duck*), CH (as in *school*), and CC (as in *account*).

Metacognition refers to the process of thinking about one's own thinking. Skilled readers use metacognitive strategies to aid comprehension.

A **morpheme** is the smallest unit of meaning or grammatical function within a word, such as a prefix, suffix, or root word. Some morphemes can stand alone as words, while others are always parts of other words (e.g., *pre–* and *–ment*).

Morphological awareness is the ability to analyze and manipulate morphemes.

Morphology is the study of the structure of language: how words are formed and how words are related to one another.

Multisensory instruction is a teaching method that uses multiple senses—sight, hearing, and touch/movement—simultaneously or sequentially to enhance memory and learning.

Orthographic processing refers to the ability to visualize the symbols of written language in the mind's eye and to quickly retrieve stored knowledge of what a word looks like from long-term memory while reading.

Orthography, the set of rules and principles that govern written language, refers to the visual elements of print. This includes spelling patterns—the varied letter combinations that can correspond with a given sound (the reverse of decoding)—as well as capitalization (e.g., *A* and *a* are two forms of the same letter) and use of punctuation.

A **phoneme** is the smallest unit of sound in a spoken word that makes a difference to the word's meaning. English consists of 44 phonemes, which combine to form syllables and words. For example, the word "bat" is composed of three phonemes, represented as /b/, /a/, and /t/; changing the first phoneme from /b/ to /h/ changes the word from *bat* to *hat*.

Phonemic awareness is a subtype of phonological awareness. It is the understanding that words are composed of a sequence of phonemes, as demonstrated by the ability to hear, isolate, and manipulate the individual sounds in spoken words.

Phonics teaches the systematic relationships between sounds (phonemes) and printed letters or groups of letters (graphemes). Students apply their knowledge of phonics and the rules of language to decode unfamiliar words.

Phonological awareness is a broad skill that involves the ability to hear and manipulate units of spoken language, such as words, syllables, and onsets/rimes, and the understanding that a word's sound is independent from its meaning. (Onset refers to the initial phonological unit in a word, such as /p/ in *pig*, and the rime is the vowel and consonant sequence that follows).

Semantics refers to the aspect of language concerned with meaning.

Sight words are words that are recognized instantly and effortlessly as a result of repeated exposure. Some words do not follow the rules of phonics and cannot be decoded; they therefore have to be committed to memory.

Syntax is the set of rules and principles governing the order and function of words in language; it dictates how words are put together to create phrases, clauses, or sentences that convey meaning. Syntax includes grammar, sentence structure and variation, and other mechanics of language.

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NOTES

[1] Moats, 1999, p. 7.

[2] Murnane, Sawhill, & Snow, 2012; Reardon, Valentino, & Shores, 2012; Snow, Burns, & Griffin,1998.

[3] The New York City public school population (including students attending public charter schools) is 40.5% Hispanic, 27.1% Black, 15.5% Asian, 14.8% White, and 2.1% other. 76.5% of students are economically disadvantaged, 18.7% are students with disabilities, and 12.5% are English Language Learners (ELLs). New York City Department of Education (DOE). (2016). Demographic Snapshot, SY 2011-12 to 2015-16. Retrieved from: http://schools.nyc.gov/AboutUs/schools/data/default.htm. Hereafter: DOE Demographic Snapshot, 2016.

[4] This number does not include students with disabilities attending public charter schools. In the 2014-15 school year, 77.5% of students with IEPs were eligible for free or reduced-price lunch and 78.7% of students with IEPs were Black or Hispanic/Latino. New York City Department of Education (DOE). (2016). Local Law 27 of 2015 Annual Report on Special Education, SY 2014-15. Retrieved from: http://schools.nyc.gov/NR/rdonlyres/6035782C-F95D-4224-8372-F2B1F7E9A226/0/LocalLaw27of2015229201 6FINAL.pdf. Hereafter: DOE Annual Report on Special Education, 2016.

[5] The District of Columbia Public Schools enroll 47,500 students in traditional public schools and 37,700 students in public charter schools; the Boston Public Schools enroll 57,000 students in traditional public schools and an additional 8,100 children attend charter schools. District of Columbia Public Schools. (2015). DCPS at a Glance: Enrollment. Retrieved from: http://dcps.dc.gov/page/dcps-glance-enrollment. D.C. Public Charter School Board. (2015). On the Road to Success. Retrieved from: http://www.dcpcsb.org/report/pcsb-annual-reports. Boston Public Schools. (2015). Boston Public Schools at a Glance: 2015-16. Retrieved from: http://www.bostonpublicschools.org/domain/238.

[6] Wolf, 2007, p. 3.

[7] Similarly, while recognizing that many children in New York City are dual language learners, we have chosen not to discuss literacy instruction for ELLs in detail, as we are not able to do this complex topic justice within a single paper.

[8] Slavin, Lake, Davis, & Madden, 2009, p. 5.

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[10] Quotes have been condensed and edited for clarity and to preserve student anonymity.

[11] Lyon, Shaywitz, Shaywitz, & Chhabra, 2005; Shaywitz, 2003; Snow, Burns, & Griffin,1998; Wanzek, Wexler, Vaughn, & Ciullo, 2010; Wolf, 2007.

[12] Hernandez, 2012.

[13] New York State Education Department. (2016). NYC Public Schools High School Graduation Rate (2014-15)—4 Year Outcome as of June. Retrieved from: http://data.nysed.gov/profile.php?instid=7889678368.

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[16] Murnane, Sawhill, & Snow, 2012; Reardon, Valentino, & Shores, 2012; Snow, Burns, & Griffin,1998; Wolf, 2007.

[17] Kutner et al., 2007.

[18] Feister, 2012a; Lyon, Shaywitz, Shaywitz, & Chhabra, 2005; Moats, 2014; Shaywitz, 2003; Shaywitz & Shaywitz, 2004; Snow, Burns, & Griffin,1998; Wolf, 2007.

[19] Feister, 2012b, p. 19.

[20] DOE Annual Report on Special Education, 2016.

[21] Feister, 2012a & 2012b; Wei, Blackorby, & Schiller, 2011.

[22] Hernandez, 2012.

[23] Feister, 2012a; Lyon, Shaywitz, Shaywitz, & Chhabra, 2005; Moats, 1999; Moats, 2014; National Reading Panel, 2000; Shaywitz, 2003; Shaywitz, Morris, & Shaywitz, 2008; Snowling & Hulme, 2012; Wolf, 2007.

[24] Feister, 2012b, p. 19.

[25] Lyon, Shaywitz, Shaywitz, & Chhabra, 2005; National Early Literacy Panel, 2008; National Reading Panel, 2000.

[26] Bailet et al., 2011; Snow, Burns, & Griffin,1998.

[27] Goldman, 2012; Lyon, Shaywitz, Shaywitz, & Chhabra, 2005; Marchand-Martella et al., 2013; National Reading Panel, 2000; Slavin, Lake, Chambers, et al., 2009; Wanzek, Wexler, Vaughn, & Ciullo, 2010.

[28] Goldman, 2012; Marchand-Martella et al., 2013; National Reading Panel, 2000.

[29] Sources on emergent literacy include: Bailet et al., 2011; Goldstein, 2011; Johnston, McDonnell, & Hawken, 2008; National Early Literacy Panel, 2008; Neuman & Dwyer, 2009; Neuman & Wright, 2014; Phillips & Meloy, 2012; Piasta & Wagner, 2010; Pullen & Justice, 2003; Snow, Burns, & Griffin, 1998; Strickland & Riley-Ayers, 2006; Wolf, 2007.

[30] Though our focus here starts with pre-K—the first year of learning that falls under the purview of the DOE—there are also promising early language and literacy interventions that target infants and toddlers. Strategies that support children's development from birth through age 3 should also be part of any comprehensive, multi-year Citywide plan.

[31] Strickland & Riley-Ayers, 2006, p. 3.

[32] Socioeconomic disparities in language processing and vocabulary development are already present at age 18 months, and a child's vocabulary at age 3 is predictive of reading comprehension skill at age 9-10. Fernald, Marchman, & Weisleder, 2013; Hart & Risley, 2003; Neuman & Wright, 2014.

[33] Goldstein, 2011; Phillips & Meloy, 2012.

[34] For example, asking questions about what happened and why, making predictions about what might happen next, and drawing connections between events in the story and real-life experiences. Research has found dialogic reading to be an effective strategy for helping preschoolers with and without disabilities build the vocabulary and background knowledge important for later reading comprehension. Goldstein, 2011; National Early Literacy Panel, 2008; Neuman & Wright, 2014; Snow, Burns, & Griffin,1998; Strickland & Riley-Ayers, 2006; What Works Clearinghouse, 2010a.

[35] For example, children frequently first learn the letters that compose their own names.

[36] For example, print-rich play centers allow children to connect words to real-life activities and incorporate print into dramatic play (e.g., price tags, signs, and food packages for a pretend grocery store).

[37] Early experiences with books and reading also help children build familiarity with the rhythm and expressions of fluent reading and the syntax and style of written language, which differs from spoken conversation.

[38] Sources on phonological and phonemic awareness include: Al Otaiba, Puranik, Ziolkowski, & Montgomery, 2009; Allor, Mathes, Champlin, & Cheatham, 2009; Armbruster, Lehr, Osborn, & Adler, 2009; National Early Literacy Panel, 2008; National Reading Panel, 2000; Phillips, Clancy-Menchetti, & Lonigan, 2008; Shaywitz, 2003; Snow, Burns, & Griffin,1998; Wolf, 2007.

[39] Al Otaiba, Puranik, Ziolkowski, & Montgomery, 2009.

[40] For example, "What sound is the same in *book*, *bike*, and *ball*? What other words do we know that start with that sound?" and "What happens if you add the /m/ sound to the word *ice*?"

[41] Al Otaiba, Puranik, Ziolkowski, & Montgomery, 2009; National Reading Panel, 2000; Phillips, Clancy-Menchetti, & Lonigan, 2008; What Works Clearinghouse, 2012.

[42] Phonological awareness develops, broadly speaking, along a continuum from larger to smaller units of sound. The ability to notice rhyming and alliteration is one of the earliest skills to emerge in preschoolers, and children will be able to recognize larger chunks of words, such as syllables, before they master the more difficult tasks of blending and segmenting phonemes.

[43] Sources on phonics include: Armbruster, Lehr, Osborn, & Adler, 2009; Lyon, Shaywitz, Shaywitz, & Chhabra, 2005; Moats, 1999; National Reading Panel, 2000; Reynolds, Wheldall, & Madelaine, 2011; Shaywitz, 2003; Slavin, Lake, Chambers, et al., 2009; Snow, Burns, & Griffin,1998.

[44] Non-systematic instruction is informal and implicit, with letter-sound relationships taught incidentally or on an as-needed basis, as they appear in texts chosen for reasons unrelated to phonics. Such instruction may focus on whole words and their meanings, with minimal attention to blending sounds and letters, and assume students will naturally deduce the rules of language on their own over time.

[45] For example, how adding the prefix *dis–* or the suffix *–ful* the to the word *respect* changes the word's meaning and usage. Morphological awareness training can also aid in the development of phonological awareness and fluency, as the pronunciation of a word is often based on its morphemes. Carlisle, 2010; Goodwin & Ahn, 2010.

[46] Sources on fluency include: Armbruster, Lehr, Osborn, & Adler, 2009; Chard et al., 2009; Chard, Vaughn, & Tyler, 2002; National Reading Panel, 2000; Rasinski, 2012; Snow, Burns, & Griffin,1998; Wexler, Vaughn, Edmonds, & Reutebuch, 2008.

[47] In whole-classroom instruction, for instance, a teacher might model what fluent reading and appropriate expression sounds like by reading aloud from enlarged text while pointing at each word as it is read, and then having students read the same text aloud in unison.

[48] Sources on vocabulary instruction include: Armbruster, Lehr, Osborn, & Adler, 2009; Lawrence, Wright, & Snow, 2010; National Reading Panel, 2000; Neuman & Dwyer, 2009; Neuman & Wright, 2014; Snow, Burns, & Griffin,1998; Wolf, 2007.

[49] Hart & Risley, 2003; Neuman & Wright, 2014.

[50] Sources on reading comprehension include: Armbruster, Lehr, Osborn, & Adler, 2009; Goldman, 2012; Kamil et al., 2008; National Reading Panel, 2000; Shanahan et al., 2010; Slavin, Lake, Chambers, et al., 2009; Snow, Burns, & Griffin,1998; Solis et al., 2012.

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[52] Sources on RtI include: Catts et al., 2015; Fuchs & Fuchs, 2006; Gersten et al., 2009. New York specific resources include: Casbarro, J. (2013). RTI: Response to Intervention. New York City Edition. Port Chester, NY: Dude Publishing, National Professional Resources, Inc. New York State Education Department (NYSED). (2010). Response to Intervention: Guidance for New York State School Districts. Retrieved from: http://www.p12.nysed.gov/specialed/RTI/guidance/cover.htm. Hereafter: NYSED RTI Guidance, 2010. For more information on RtI, see: http://rtinetwork.org/.

[53] National Early Literacy Panel, 2008; Wolf, 2007.

[54] Al Otaiba et al., 2014; Vaughn, Denton, & Fletcher, 2010.

[55] New York State Education Department (NYSED). (2011). A Response to Intervention (RtI) Process Cannot Be Used to Delay or Deny an Evaluation for Eligibility under the Individuals with Disabilities Education Act (IDEA). Retrieved from: http://www.p12.nysed.gov/specialed/RTI/federalguidance-511.htm.

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[59] Ibid.

[60] What Works Clearinghouse, 2013.

[61] Slavin, Lake, Davis, & Madden, 2009.

[62] Ransford-Kaldon et al., 2013.

[63] E. Reiter, personal communication. (2016, February 2).

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[66] Wolf, 2007, p. 209.

[67] Walsh, Glaser, & Wilcox, 2006.

[68] Greenberg, Walsh, & McKee, 2015, p. 91.

[69] Goldman, 2012; Washburn, Joshi, & Cantrell, 2011; Wolf, 2007.

[70] Slavin, Lake, Chambers, et al., 2009, p. 1453.

[71] Slavin, Cheung, Groff, & Lake, 2008.

[72] Moats, 1999; Slavin, Cheung, Groff, & Lake, 2008; Snow, Burns, & Griffin,1998.

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[79] Slavin, Lake, Davis, & Madden, 2009.

[80] NYSED RTI Guidance, 2010.

[81] Duff & Clarke, 2011, p. 8.

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[83] Shaywitz, 2003, p. 86.

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[86] International Dyslexia Association, 2014.

[87] Chard et al., 2009; Chard, Vaughn, & Tyler, 2002; Goodwin & Ahn, 2010; Lee & Yoon, 2015; Moats, 2014; Shaywitz, 2003; Shaywitz, Morris, & Shaywitz, 2008; Wolf, 2007.

[88] Duff & Clarke, 2011; Snowling & Hulme, 2012.

[89] El Zein, Solis, Vaughn, & McCulley, 2014.

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[91] Ritchey & Goeke, 2006; Vaughn & Linan-Thompson, 2003.

[92] For more information, see: http://www.wilsonlanguage.com/professional-learning/ and http://www.ortonacademy.org/.

[93] Advocates for Children of New York obtains tutoring hours (paid for by the DOE) at Lindamood-Bell Learning Centers for our clients when necessary and appropriate for an individual student's learning needs. In addition, the company has donated to AFC in support of our annual benefit. Apart from fact-checking our description of their programs and providing outcomes data on our clients, no representatives of Lindamood-Bell were involved in the drafting or publication of this report, and AFC did not benefit financially or otherwise from their inclusion here.

[94] What Works Clearinghouse, 2008, 2010b.

[95] Lindamood-Bell Learning Processes. (2015). Learning Center Results, Seeing Stars Results (US). Retrieved from: http://lindamoodbell.com/learning/seeing-stars-results.

[96] The 18 students ranged in age from grade 2 to grade 11. Each received an average of 348 hours of tutoring using primarily Seeing Stars (some also received Visualizing and Verbalizing instruction). Reading gains were measured using a battery of standardized assessments, including the Woodcock Reading Mastery Tests, the Gray Oral Reading Test, the Wide Range Achievement Test, and the Slosson Oral Reading Test. Students made statistically significant gains on seven out of eight measures, four of which are depicted in Figure 3.

[97] Krafnick, Flowers, Napolielloa, & Eden, 2011.

[98] Lindamood-Bell Learning Processes. (2015). Learning Center Results, Visualizing and Verbalizing (US). Retrieved from: http://lindamoodbell.com/learning/visualizing-and-verbalizing-us.

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[103] Edmonds et al., 2009; Scammacca, Roberts, Vaughn, & Stuebing, 2015; Wanzek et al., 2013.

[104] Joseph & Schisler, 2009; Wanzek et al., 2013.

[105] Scammacca, Roberts, Vaughn, & Stuebing, 2015, p. 387.

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