RESEARCH & PRACTICE

What research tells us about new kindergarteners—and how you can boost reading and math skills

nwea

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COVID-19 has disrupted everything about education, from how we welcome new kindergarteners to how we celebrate young adults ready for life after graduation. Despite all the challenges, school-age children continue to learn and grow because of you. No matter the obstacle, you're finding creative new ways to reach your students—and research shows they're working.

If you're a kindergarten teacher, this eBook can make your efforts a little easier by helping you better understand your young learners. It begins with research findings on readiness at school entry from the NWEA research team. Then two posts from the NWEA blog, Teach. Learn. Grow., help you go from theory to practice. We hope it will help support your very important work.

Trends in children's academic skills at school entry: 2010–2017

Megan Kuhfeld, James Soland, Christine Pitts, and Margaret Burchinal

KEY FINDINGS

- **Students' academic skills at school entry were mostly flat between 2010 and 2014, then declined slightly from 2014 to 2017, with a larger decrease in mathematics.**
- **Racial/ethnic achievement gaps at school entry narrowed significantly from 2010 to 2017.** The Black-White gap decreased by about 0.11 standard deviation (SD) in mathematics and 0.09 SD in reading, while the Hispanic-White gap decreased by 0.09 SD in mathematics and 0.11 SD in reading.
- **Public school district pre–K program enrollment was not associated with changes in students' academic skills between 2010 and 2017.**

Children's academic skills at school entry are a critical foundation for subsequent learning and development. Research has shown both that the early math and reading skills of students as they start kindergarten are a strong predictor of their future academic achievement[i] and earnings,[ii] and that there are substantial, troubling disparities: children from low-income families or from traditionally underrepresented minorities enter school with lower reading and math skill levels than do their more advantaged peers.[iii] Because of this, recent state and federal policies have focused on promoting early care and education programs to improve academic skills in early childhood for all children, especially targeting low-income children.[iv]

Research using Early Childhood Longitudinal Survey-Kindergarten Cohort (ECLS-K) data provides important insight into how children's academic skills at school entry have changed from 1998 to 2010. Studies found, for example, that U.S. students entered kindergarten with stronger teacher-reported math and literacy skills in 2010 than in 1998,[v] and that some racial/ethnic achievement gaps in math and reading skills at school entry narrowed during this time,[vi] but there were mixed results for changes in income-related gaps.[vi,vii]

The world and education are far from static, though, and since 2010, myriad changes in policies, practices, and society have taken place in the U.S., many of which may impact children and the skills they have when they start school. Income inequality has widened between 2010 and 2017[viii] and the proportion of students whose parents speak a language other than English at home increased during the last decade.[ix] Shifts in public policies, especially increased funding for and increased enrollment in pre–kindergarten programs, many directed toward students from lower-income families or with risk factors, is another potentially important change. Thirty-three percent of 4–year-olds in the U.S. were enrolled in state pre–kindergarten programs in 2017, an increase of nine percent in a decade.[x] Studies have shown that pre–K programs very greatly in quality and impact, but generally improve student skills at school entry.[xi]

Given these changes, and the importance of early academic skills for long-term success for students, understanding how differences in skills at school entry by race/ethnicity and income have changed over time is critical. There are challenges to examining these changes at the national level, however. The most recent national data on kindergarten students from the ECLS-K is from 2010, and most state testing programs do not begin until students are in third grade.

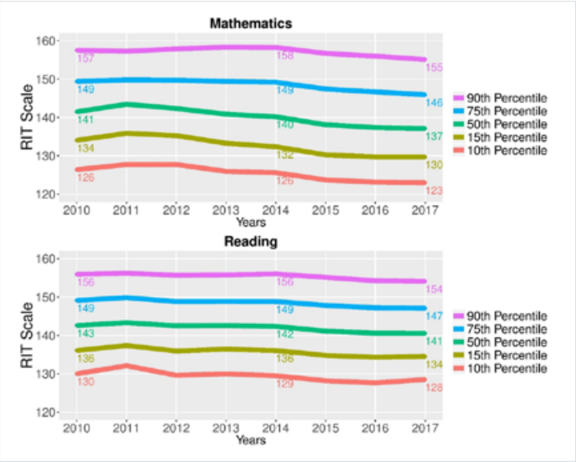
Despite the lack of federally mandated testing in early grades, school districts across the country have increasingly turned to the MAP® Growth™ assessments to measure student academic skills in kindergarten. In this study, we use reading and mathematics scores and demographic data from over two million students who entered kindergarten between the fall of 2010 and the fall of 2017. In total, the sample included students from over 10,500 schools across all 50 states, representing approximately one in five U.S. public schools serving kindergarten students. Additionally, we used school- and district-level data from Common Core of Data (CCD) and the Stanford Education Data Archive (SEDA) to weight the sample to better represent the demographics of the overall U.S. kindergarten population within each year.

This study addressed three questions:

1. What are the trends in children's math and reading achievement at school entry between 2010 and 2017?
2. How have achievement gaps at school entry by race/ethnicity, gender, and school poverty level changed over the last eight years?
3. Are changes across time in school districts' pre–K enrollment associated with trends in students' math and reading skills at school entry?

Students' achievement levels at school entry declined slightly from 2010 to 2017.

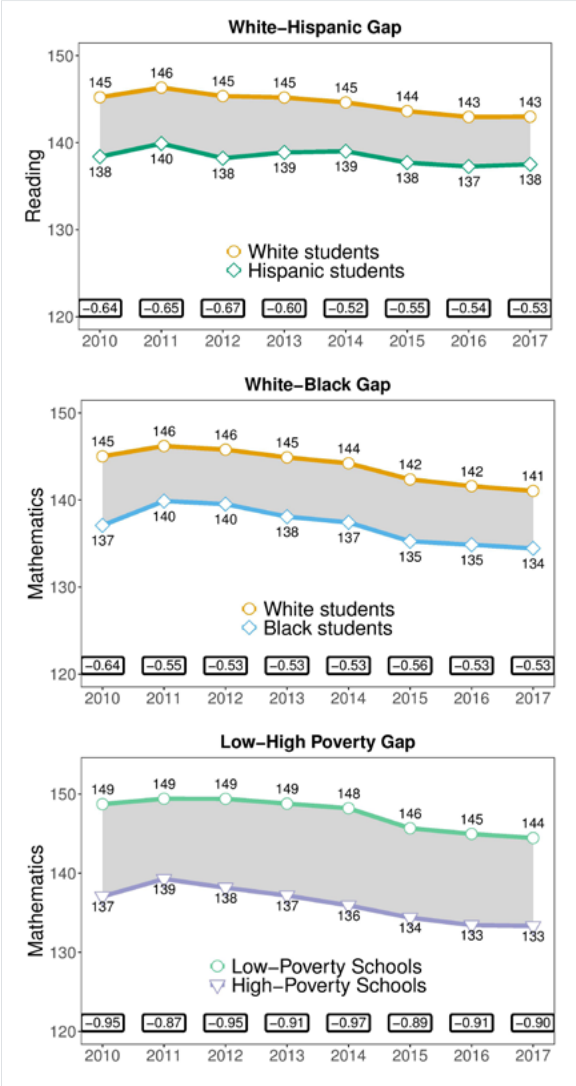
Students' achievement levels at school entry were mostly flat in the first half of the decade, but slightly decreased between 2014 and 2017 in both mathematics and reading. The median kindergarten student's score dropped approximately four RIT points, or 0.24 standard deviations (SDs), in mathematics and two RIT points, or 0.14 SD, in reading during the eight-year time span. This trend was consistent across low-, middle-, and high-achieving students.



Trends in mathematics and reading scores at school entry between 2010 and 2017 by score percentile.

Racial/ethnic achievement gaps at school entry narrowed significantly, but modestly, from 2010 to 2017.

Racial/ethnic achievement gaps between Black and White and Hispanic and White children at school entry narrowed modestly over the last eight years. In 2010, the average mathematics score for White kindergarteners was 0.64 SD higher than for their Black peers, significantly larger than the 0.53 SD difference between Black and White students in 2017. In reading, the Black-White gap narrowed from 0.51 to 0.42 SD over the eight-year span. The Hispanic-White gap at school entry also narrowed, dropping from 0.68 to 0.59 SD in mathematics and from 0.64 to 0.53 SD in reading. The Asian-White gap fluctuated somewhat over time but lacked a clear overall trend.



Selected trends in achievement gaps at school entry in mathematics and reading, 2010–2017. White-Hispanic gap trends in reading (top panel), White-Black gap trends in mathematics (middle panel), and low-high poverty gap trends in mathematics (bottom panel) are shown. Gaps in a standardized metric are reported as boxed numbers at the bottom of each chart. See the paper for the full figure.

After accounting for school-level poverty, Black-White and Hispanic-White achievement gaps substantially decreased, with an average reduction in gaps of about 0.18 SD in mathematics and 0.16 SD in reading. However, even after controlling for school poverty, racial/ethnic gaps at school entry remained statistically significant across all years in both math and reading, and the pattern of narrowing of these gaps remained consistent.

Less change was seen in gender gaps: female students scored higher than male students in both mathematics and reading at school entry each year in this study, and the 2017 reading achievement gap between male and female kindergarteners, 0.16 SD, was unchanged from 2010. The mathematics male-female gap favoring female students narrowed slightly, declining from 0.09 SD in 2010 to 0.05 SD in 2017.

Lastly, as we did not have an individual measure of socioeconomic status for the students in our sample, we examined achievement gaps between low and high-poverty schools. The low-high school poverty gap in math declined from 0.95 SD in 2010 to 0.90 SD in 2017, and the gap in reading narrowed from 0.88 SD in 2010 to 0.77 SD in 2017. In both math and reading, the primary years in which achievement gaps narrowed (2013–2017) corresponded to the same period in which the trends for both groups are negative.

Public school district pre–K program enrollment was not associated with changes in students' academic skills.

Analysis of variation in scores between districts showed that a sizable amount of the variation in math and reading scores of children at school entry in 2010 was between districts, rather than between schools within districts (47 percent of variation in reading and 48 percent in math). However, the degree to which district scores decreased from 2010 to 2017 did not significantly vary by percent pre–K enrollment in the district (calculated based on district-level pre–K enrollment counts from the CCD). Rather, districts with high pre–K enrollment showed similar overall drops across time as districts that did not offer pre–K programs.

RECOMMENDATIONS

More exploration is needed to understand factors driving changes in children's skills at school entry.

The results of this study present a somewhat mixed picture of the state of students' academic skills at school entry. On one hand, academic achievement at school entry slightly declined in the past few years, and this negative trend was not associated with the percent of students enrolled in district pre–K programs. On the other, achievement gaps by race/ethnicity and school poverty showed modest, but promising, reductions during the same period. Although no other large-scale studies have yet examined kindergarten trends during this past decade, these recent drops are mostly consistent with recent results in fourth-grade students on NAEP. Between 2011 and 2013, U.S. fourth graders showed small increases on NAEP, followed by small declines between 2015 and 2017.[xii] While this descriptive study cannot determine whether the drops that the two tests show reflect the same underlying phenomena or identify potential policy and practice mechanisms underlying the differing trends in achievement and gaps, additional investigation into potential policy and practice mechanisms underlying these trends is warranted.

Policy makers, education leaders, and researchers should work together to better understand, support, and evaluate high-quality pre–K programs.

This study also examined whether trends in math and reading skills were associated with changes in districts' pre–K enrollment across time. The results showed that public school district pre–K program enrollment was not associated with the observed changes in students' academic skills. These findings are consistent with other research[v] that found that their measures of preschool participation within ECLS-K did not account for any of the changes seen in teacher-reported math or literacy skills between 1998 and 2010.

This apparent lack of connection between pre–K experiences and entry-to-school reading and math skills may raise important questions about the current policy focus on pre–K programs to address inequities in our society. Pre–K programs are diverse, with over 60 programs in 43 states and D.C. that vary dramatically in quality according to widely accepted standards.[x] The most promising results for children in pre–K programs often come from high-quality programs that include evaluation of the program's impacts on students. Generalizing these promising findings to programs across the country that vary so widely may be questionable.

Research can provide important insights, but the fragmented context of early learning programs can create challenges in comparing programs across districts and states and in private and public programs. Policies should encourage evaluation of programs and expand practices that make it easier to compare programs across diverse settings. In this way policymakers, education influencers, and researchers can better identify and influence the critical levers for improving quality programming and build from successful approaches to direct resources and leverage assets to better support all children's early learning.

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“Grade-level” text for kindergarten and first grade: More on how reading is a team sport

Cindy Jiban

If you’re a reading teacher, I’m sure you’re hearing loud and clear that we need to teach all kids with complex, grade-level text. Access to that text is an equity issue.

But wait: What about kindergarten and first grade? If we try looking up a Lexile® range in the Common Core appendix, we find some N/As on the chart for K–1. So what should we use? Many of these kids can’t really read yet, so what does it even mean to think about text level?

Those tuned in to debates about best practices in literacy instruction know that all of this can feel as confusing as picking up two radio stations at once. We hear strong voices arguing for use of complex, grade-level text. But we also hear strong voices—often the very same ones—insisting that systematic, explicit phonics instruction using phonics-aligned text is both effective and a key equity issue. And research supports both assertions.

How do we reconcile these two when we’re trying to choose a book? For an early reader, which kind of text is right? Do we lean into phonics patterns, or do we lean into meaning-rich text? Should I get a “decodable” text, or an award-winning picture or chapter book with great themes? Once I’ve selected a text, how can I involve families in building a confident reader?

Let’s pull this apart a bit, tuning into one radio station at a time. First, let’s look at an example text for each assertion.

Two kinds of texts

Here’s a (fake) text that is all about early phonics patterns: *Hats!*, by Yours Truly. You’ll have to imagine some adorable illustrations.

> Rat has a hat. Rat is in his hat.
> Rat has a ham. The ham has a hat.
> A ham in a hat? Hats, hats, hats!

And here’s a sentence from a real text that is rich with meaning, *The Boy Who Harnessed the Wind* by William Kamkwamba and Bryan Mealer.

> In a small village in Malawi, where people had no money for lights, nightfall came quickly and hurried poor farmers to bed.

Here’s the spoiler: there is a role for both kinds of text for primary grades. One is for kids to practice the phonics they are being explicitly taught, and one is for kids to gain meaning, so they can develop their language, comprehension skills, and knowledge. Let’s look more closely at each.

Decodable text

Notice that the fake text hits really hard on the short A vowel sound, and it repeatedly uses words with either the -AT ending or the HA- beginning (or both). Filler words (“is,” “in,” his, “has”) are carefully chosen to stick with simple, short-vowel-sound spellings. If beginning readers try the most frequent sound for a letter as they try to read a word, they will be successful with this text. This makes this kind of text *decodable* for a child who has been taught only the first smidges of phonics.

Notice also that the meaning is pretty pointless. You often see this most starkly in the decodable books targeted to very beginning phonics. The language is far simpler than what kids hear in everyday conversations, too. *Hats!*, then, is no good for developing language, comprehension skills, or knowledge. While *Hats!* is an extreme example of this “no good” category, it’s not hard to find books for earliest readers that have this same profile.

We would prefer books that are decodable but interesting. But here’s why I think these decodable texts are critical at the very beginning of learning to decode,

even if they are a little boring: they set kids up to succeed as they apply the phonics they are learning. This makes them great for helping beginning readers trust that the best way forward in reading is using sounding-out strategies. The best strategy to rely on is not guessing, hunting in the illustrations, or memorizing word shapes. It is using phonics.

We can teach kids to rely on their phonics knowledge by doing two things: 1) Teach them phonics, explicitly and systematically. 2) Give them texts where, to a significant degree, the taught phonics *works* for figuring out the words. Because success is an incredible motivator.

Complex, meaning-rich text

Now let’s talk about *The Boy Who Harnessed the Wind*. In addition to having showstopping illustrations by Elizabeth Zunon, this book checks all the boxes as a read for focusing on meaning. It’s a nonfiction tale about a boy who figures out how to build a wind turbine in his hometown in Malawi, so it’s great for building knowledge about energy and geography and makerspace engineering. On top of that, it has layers of meaning and repeated themes (is it magic or science that helps the boy succeed?) and it has great word choice and language complexity.

Here’s that excerpt from earlier again, because I want you to notice a couple things.

> In a small village in Malawi, where people had no money for lights, nightfall came quickly and hurried poor farmers to bed.

See the sentence structure, which has a couple of dependent clauses before it arrives at the independent one? We don’t use that complexity of syntax in talking, especially to young kids, so we need written texts like this one to expose kids to these kinds of structures. Notice, too, how nightfall seems almost like a person as it hurries the villagers to bed. What a great chance to introduce personification!

Now let’s think about the box this book doesn’t check so well. Think about how “village” will sound for the beginning reader, who is applying a sound for each and every letter. No one taught them yet that -AGE at the end of a multisyllabic word tends to say “edge,” so they are likely to come up with something like “vill-a-geh.” No one taught them yet about -IGH saying “eye,” so sounding out “lights” is probably going to produce a messy tangle of letter sounds instead of a word.

For a very beginning reader trying to decode the words in this book on their own, the chances of success using letter sounds are low. That’s why we don’t use this book that way for kids at

We can teach kids to rely on their phonics knowledge by doing two things:

1. **Teach them phonics, explicitly and systematically.**
2. **Give them texts where, to a significant degree, the taught phonics works for figuring out the words. Because success is an incredible motivator.**

this early level of decoding. Instead, to let kids who can’t read it yet access that rich meaning, we read it aloud to them. As they develop as early readers, maybe we do some strongly supported practice at reading it, sure. But we don’t pretend that this is the book that will set kids who are just now learning simple short vowel sounds up for success.

Text choice is about purpose

Let’s get back to the question at the start of this post: What is the right text for kindergarteners and first-graders? It’s both kinds. It’s more-decodable text that explicitly supports the phonics currently being taught. And it’s complex, juicy text that offers opportunities for lessons that develop language, comprehension, and knowledge. These two start to converge more, in later grades: eventually patterns like -AGE and -IGH will fall into the decodable category. But in kindergarten and first grade, these are two different kinds of text with two very different levels of readability. Both are the right text level for these grades, when we let them work in collaboration.

If you’re a primary-grade teacher, you know this. You know to choose text according to a specific purpose, and you know to pair each selection with active and intentional instruction. But what about families, who are supporting student learning more than ever these days?

[C]omplex, juicy text [...] offers opportunities for lessons that develop language, comprehension, and knowledge.

Teaming texts and teaming with families

Let’s remember that many parents or guardians are caring for a bouncy and fussy six-year-old all day while simultaneously working—or while stressing out about finding new employment that is safe. Most of them are on the verge of Tina Fey–style sheet caking. They want to find a way to help, but they need instructions to be clear. They need how they help to match their capacity.

It’s time for teachers and families to dive into some authentic, mutually supportive conversations about what each of us can do. Which of us can help the child practice with phonics-aligned decodable texts? Which of us can read meaning-rich books—mostly to the child, but gradually *with* them—and talk about meaning? In a strategic partnership, how can we capitalize on the specialized training a teacher has while also capitalizing on the special relationship—and the simple fact of co-location in the same room—that a parent has with a child?

In 2020, there is definitely such a thing as too much cake. But there’s no such thing as too much collaboration. Not when it comes to supporting my favorite kind of humans: the ones who are learning to read. **TLG**

5 patterns in math skills of new kindergarteners—and 4 ways to address them

Elizabeth Barker

This year, educators and administrators hit the ground running to prepare students for our new normal amid COVID-19. While many students received distance learning last spring, the extent to which they did is unknown. This is especially true for our youngest students: preschoolers who are now entering their first year of traditional school as kindergarteners. Meanwhile, coronavirus continues to reshape traditional schooling.

Even under normal circumstances, we know there are often big gaps in the skills students bring with them to kindergarten. Understanding the differences in skills students enter school with during a standard school year provides an important baseline for interpreting the unique circumstances of the 2020–21 school year.

To better understand what educators are up against, my colleagues and I have started to investigate what math skills we typically see in kindergartners when they first start school. We're examining data on how past kindergarteners performed on their fall MAP® Growth™ K–2 mathematics test and which types of questions they consistently answered correctly. Additionally, we're organizing data into three groups: bottom 25th percentile, 25th–90th percentile, and top 10th percentile. Here is a summary of what we've found so far.

Pattern #1: Spatial language and math vocabulary are strongest for high-performing students

Students in the top 10th percentile are able to accurately answer the most questions with spatial language and math vocabulary that directs them to compare.

Spatial language—specifically prepositions such as "below," "above," and "next to"—helps communicate mathematical thinking. Data shows higher-performing students have a greater breadth of knowledge with comparing words. For example, students in the bottom 25th percentile tend only to answer questions with the comparing words "more" or "less," while higher-performing students succeed with questions using additional comparing words and phrases, including, "less than," "least," "greater," and "greater than."

Pattern #2: Spatial skills sometimes need a boost

Understanding prepositional phrases is an example of a spatial skill, but we also look for the ability to do things like apply geometric concepts in the real world by identifying shapes and taking apart polygons. Students in the mid and top percentiles tend to answer more questions correctly about identifying and describing two-dimensional and three-dimensional shapes, varying sizes of shapes, and orientation of shapes within the environment.

Pattern #3: Counting and cardinality complexity is difficult for students in the bottom 25th percentile

The majority of students correctly answer questions with average language concepts, “same” and “different” language, and a call to orally count to 10. But similar to what we saw in students’ use of comparing language, mid- and high-performing students are better able to correctly answer more complex questions, such as those with one-to-one correspondence, requiring the ability to count beyond 20, and asking them to begin adding objects with sums of 10.

Pattern #4: Operations and algebraic thinking is missing for students in the bottom 25th percentile

Students who are lower-performing at kindergarten entry are not accurately answering questions about operations or algebraic thinking, and the goal area is completely missing from the data we’ve gathered for that group. However, we see mid- or high-performing students who are accurately answering questions around counting and geometry doing well with foundational questions about operations and algebraic thinking.

Pattern #5: Measurement and data skills are the same for all groups

We did not see many differences in the ability to work with measurement or data between the three groups.

Student strengths by group

To help you better understand what your students will be ready for this fall, the following tables provide a snapshot of strengths by grouping.

Strengths of students in the bottom 25th percentile		
Counting & cardinality	**Geometry**	**Measurement & data**
• Compares a set of objects using the terms "less" and "more" • Counts out a given number of objects within 10 • Classifies objects as same or different	• Identifies 2D shapes • Matches names of shapes to given 3D figures • Understands the prepositions "below," "closest," and "across" • Recognizes objects in the environment as a triangle, square, and cone	• Compares size, length, and width of objects

Students who performed mid-range had all the strengths of students in the 25th percentile plus the following.

Strengths of students in the 25th–90th percentile			
Counting & cardinality	**Geometry**	**Measurement & data**	**Operations & algebraic thinking**
• Represents a given set of objects as a numeral within 5 • Reads and writes whole numbers within 10 • Classifies objects as same or different • Adds with sums within 5 given two sets of objects • Compares numbers using the terms "largest," "same," "smallest," and "greater than" • Represents a given set of objects as a numeral within 20 • Compares sets of objects using the terms "less" and "more" • Counts by 1s within 100 • Adds whole numbers with sums within 5 in a vertical format and given objects	• Understands the prepositions "under," "below," "closest," "between," and "above" • Classifies a given object from the environment as a triangle, cone, square, rectangle, or circle • Matches shapes to a given shape • Composes simple shapes from given polygons • Identifies a square, cone, circle, triangle, rectangle, and hexagon • Identifies a 2D face of a 3D shape • Matches names of shapes to given 2D and 3D shapes • Identifies 2D shapes with a given attribute • Sorts objects into categories	• Compares the size, width, length, height, and weight of objects	• Represents a put-together/take-apart problem using objects • Solves for the total in put-together word problems with numbers within 5 using objects • Represents an add-to word problem using objects

Most students performing in the top 10% of the score distribution had all the strengths of the other students plus the following.

Strengths of students in the top 10th percentile			
Counting & cardinality	**Geometry**	**Measurement & data**	**Operations & algebraic thinking**
• Compares sets of objects using the term “most” • Compares sets of objects or numbers using the terms “more,” “less,” “less than,” “least,” “same,” “smallest,” “largest,” “fewest,” “fewer,” “greater than,” and “greatest” • Adds whole numbers with sums within 10 in a horizontal format and given objects • Reads and writes whole numbers within 20 • Counts out a given number of objects within 5, 10, 20, 100 • Adds whole numbers with sums within 5, in both a horizontal and vertical format • Adds with sums within 10 given two sets of objects	• Recognizes objects in the environment as a triangle, square, cone, rectangle, hexagon, circle, cube, and sphere • Matches names of shapes to given 2D shapes • Understands the prepositions “across,” “above,” “beside,” and “next” • Compares attributes of 3D shapes • Sorts 2D shapes based on shared attributes • Classifies shapes as flat/2D • Composes shapes from given polygons • Sorts shapes with a given number of corners	• Compares the height, weight, and length of objects	• Solves for the result in take-from word problems with numbers within 10 using objects • Represents a take-from word problem using objects • Solves for the result in take-from word problems with numbers within 5 using objects • Solves for the result in add-to word problems with numbers within 5 using objects • Represents a put-together /take-apart problem as an addition equation • Solves for the result in add-to word problems with numbers within 10 using objects

Activities to support all students

Here are four things you can do to support your kindergarteners:

1. **Work spatial language into your math, reading, and language arts centers.** Incorporate hands-on activities that encourage spatial language, such as building houses using triangles and squares, then placing trees "between" them. Or have students use various shapes to create a scene and have them describe their scene using spatial language (e.g., "between," "next to," "across") or comparing vocabulary (e.g., Marcus's tree has "fewer" apples than mine).

2. **Develop spatial skills.** A fun way to incorporate more spatial skills is building Lego sets. This can support and develop spatial reasoning while reinforcing spatial language and math vocabulary. Additionally, don't shy away from technology. There are some pretty slick geometry apps available.

3. **Focus on more difficult counting and cardinality skills.** For students performing below the 25th percentile, activities around subitizing, which is the ability to recognize how many items are in a small set, are key. For example, students could practice recognizing the number of dots that appear on dice. Start small and count objects to five, then build up gradually, eventually adding the numerals 1, 2, 3, 4, and 5 to the amount represented.

As kindergartners begin their schooling either remotely or in the classroom, the importance of recognizing what they know and understand in math is essential.

4. **Build a foundation for operations and algebraic thinking.** Based on what we are seeing, young learners must have a foundation in counting, cardinality, and geometry to build up to operations and algebraic thinking. Once students get there, encourage growth. Continuous efforts with patterns and sequencing skills in activities such as puzzles, board games, or cards are sure to pay off.

As kindergartners begin their schooling either remotely or in the classroom, the importance of recognizing what they know and understand in math is essential. As the information here shows, there is a large difference in not only numeracy skills but spatial language and skills as early as fall of kindergarten. With this information, we hope it will be easier to build foundational skills with students so they can become successful and grow in mathematics. **TLG**

About the researchers

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Dr. Megan Kuhfeld is a research scientist II for the Collaborative for Student Growth at NWEA. Her research seeks to understand students' trajectories of academic and social-emotional learning (SEL) and the school and neighborhood influences that promote optimal growth. Dr. Kuhfeld completed a doctorate in quantitative methods in education and a master's degree in statistics from the University of California, Los Angeles (UCLA).

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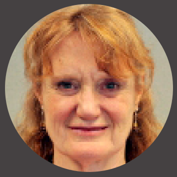
Dr. James Soland is a senior research scientist at the Collaborative for Student Growth at NWEA and an assistant professor at the Curry School of Education at the University of Virginia. His research focuses on assessment and evaluation policy and practice, with particular emphasis on measuring social-emotional learning, test engagement, and estimating teacher and school effectiveness. Dr. Soland completed a PhD in educational psychology at Stanford University with a concentration in measurement and policy.

Christine Pitts
Dr. Christine Pitts, research and evaluation manager at Portland Public Schools, is an educator, leader, and researcher by training. From 2017 to 2020, she worked as a research scientist and policy advisor at NWEA. Her policy research focuses on elevating diverse stakeholder narratives through network analysis and mixed methods research. Dr. Pitts earned her PhD from the University of Oregon and previously worked as a teacher and school administrator.



Margaret. R. Burchinal
Dr. Margaret R. Burchinal is a senior research scientist at the Frank Porter Graham Child Development Institute at the University of North Carolina at Chapel Hill and an adjunct professor in the Department of Education at the University of California, Irvine. She has been a leading researcher and statistician in child care research and a widely recognized applied statistician. She has authored or co-authored over 150 papers published in peer-reviewed journals, including *Child Development*, *Developmental Psychology*, and *Science*. She holds a PhD in quantitative psychology from the University of North Carolina at Chapel Hill.

About the blog authors

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Elizabeth Barker, accessibility research scientist in the Collaborative for Student Growth at NWEA, began her career in education as a middle school and elementary special education teacher, specifically of students with mild-to-moderate disabilities in Michigan and Colorado. She received her doctoral degree with an emphasis on growth trajectory for students with learning disabilities in mathematics and reading comprehension from the University of Oregon. Her current research focuses on how growth trajectories vary among students with visual impairments, deafness and hearing loss, and other disabilities.

Cindy Jiban
Cindy Jiban has taught in elementary and middle schools, both as a classroom teacher and as a special educator. She earned her PhD in educational psychology from the University of Minnesota, focusing on intervention and assessment for students acquiring foundational academic skills. After contributions at the Research Institute on Progress Monitoring, National Center on Educational Outcomes, and Minnesota Center for Reading Research, Cindy joined NWEA in 2009. She is currently principal academic lead.

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