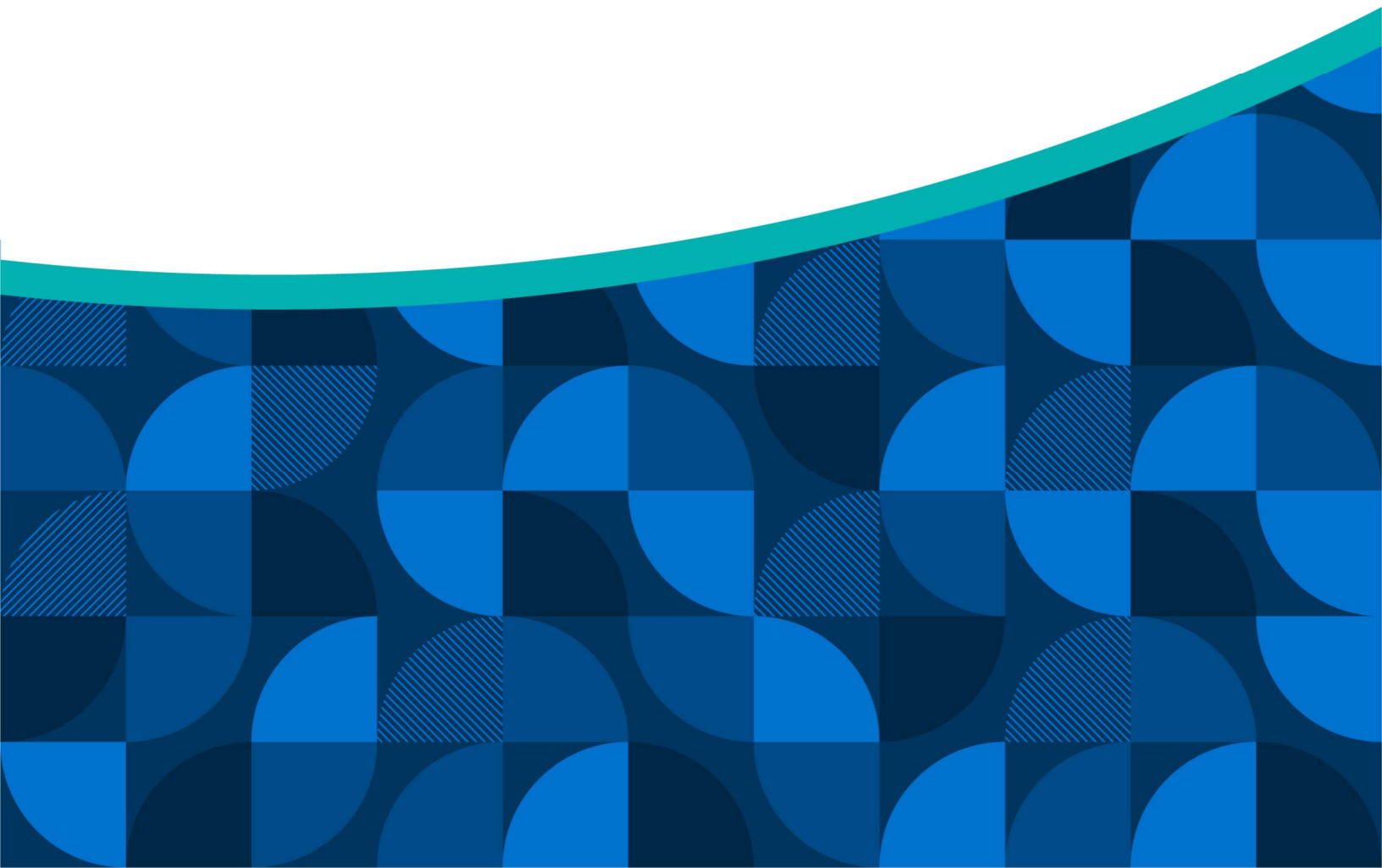




DISTRICT LEADERSHIP FORUM

Algebra I Student Success

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District Leadership Forum

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1) Executive Summary

Key Observations

Facilitate teacher data-driven decision making for math interventions and course placements through easily accessible data and structured review processes. Math teachers at District B review results from common summative assessments, screeners, and state assessments in Professional Learning Communities (PLCs) to better understand skill gaps. District E math teachers at both the middle and high school level receive student reports directly from the district's self-paced learning system. Math teachers meet monthly with the district's math facilitator to discuss these reports as well as unit assessment data and develop necessary interventions. District D teachers receive real-time data from the [EduLastic](#) application to alter daily instruction and conduct interventions as needed. Similarly, District A introduced [Formative](#) for its middle school teachers to determine when to conduct interventions.

Offer structured academic support time during the school day. All profiled districts offer academic support time throughout the school day. District A students may enroll in an additional math support class as well as a general academic support class. Similarly, middle school students at District F may enroll in a 60-minute intervention period rather than an elective. At the high school level, students may enroll in the district's intervention Algebra I course rather than the standard Algebra I course. All ninth grade students in District D take two one-year math courses which embeds this support option in all students' schedules. Similarly, District C and District E also offer intervention courses. While District B does not offer a designated academic support class, district teachers instead invite students to work with them during either their homeroom or the school-wide common study period.

Focus professional development on instructional practices rather than math content alone for lasting change. All profiled districts focus professional development on instructional practices. Contacts at District C report professional development currently centers on the science of reading and cultural proficiency. Similarly, curriculum providers lead professional development on instructional practices at District F and District D. More formally, District E offers a week of professional development every summer on instruction. Administrators at District B note professional development, typically led by district instructional coaches, also focuses on general instructional practices rather than subject content. District A contracted with a math professor from a local university for professional development training on shifting algorithmic instruction to conceptual, inquiry-based instruction.

Incorporate instructional coaching as a core pillar of teacher professional development to promote continuous improvement. Five profiled districts discuss working with instructional coaches to improve math instruction through cycles of observation and feedback. Profiled districts use both external and internal coaches. In District D, middle school math teachers work with [LearnZillion](#) coaches, while District A math teachers worked with a local math professor. Instructional coaches at District B and District E lead coaching cycles, among other responsibilities.

2) Algebra I Course Structure

Scheduling and Placement

Address the Variety in Algebra I Readiness to Promote Success for All Students

As administrators at District C note, **students arrive in Algebra I with a wide range of math skills**. Despite this, most students take Algebra I in the eighth or ninth grade, often constrained by district and state graduation requirements as well as college access concerns.¹ **Some students experience success in mathematics regardless of instructional or curricular quality.**² Five profiled districts place students who perform well on math screeners, state math assessments, and pre-algebra math course assessments into accelerated Algebra I tracks.³ Accordingly, **this disparity in readiness among students taking Algebra I in the eighth versus ninth grade may underlie performance discrepancies between these grade levels.**

Administrators at District A emphasize **the importance of student readiness to academic achievement** in Algebra I. All students in District A begin Algebra I in the eighth grade. Students placed in the advanced track complete the course in one year. Other students complete the course over two years (i.e., eighth and ninth grades). Administrators at District A report students in the one-year Algebra I course outperform peers in the two-year Algebra I course on state standardized tests, though district administrators note both groups demonstrate room for improvement. Administrators suggest **this gap may be reflective of the readiness of students** placed in the one-year versus two-year course, rather than any difference in instructional quality (both district Algebra I teachers instruct eighth and ninth grade students):



Our kids who are taking Algebra I in one year [eighth grade] ...you're going to see them excelling, perhaps despite what we do.

- Administrator at District A

Administrators at District E further confirm this discrepancy in students' skills and find **state graduation requirements can push students into Algebra I in ninth grade that do not demonstrate readiness** due to gaps in fundamental skills. Administrators would prefer to wait and enroll students in Algebra I later. Even with skills-based remediation offered through middle school intervention courses, students remain unprepared. One administrator compares learning math to learning a foreign language:

- 1) Over 60 percent of states and the District of Columbia require proficient completion of algebra content for high school graduation. (Macdonald, Heidi, Jennifer Dounay Zinth, and Sarah Pompelia. "50-State Comparison: High School Graduation Requirements," [Education Commission of the States](#), Feb. 14, 2019.) Research based on 2012 survey data finds over 90 percent of districts require Algebra I for graduation and shows most students take Algebra I in the ninth grade, though most districts also report increasing enrollments for Algebra I in the eighth grade. (Remillard, Janine T. et al. "Universal Algebra I Policy, Access, and Inequality: Findings from a National Survey," [Education Policy Analysis Archives](#), 2017.) According to the College Board, most colleges expect students complete at least three years of math in high school. Algebra I is the gateway to the math courses the College Board recommends as well as to advanced science coursework. ("High School Classes Colleges Look For," [College Board](#).)
- 2) The RTI Action Network reports 75-80 percent of students should meet competencies with the support of Tier I instruction (research-based core instruction) as part of a Response to Intervention (RTI) framework. During early implementation of RTI, schools with successful programs may find 50-75 percent of students still meet competencies with the support of Tier I instruction. (Shapiro, Edward S. "Tiered Instruction and Intervention in a Response-to-Intervention Model," [RTI Action Network](#).)
- 3) District D does not track students in math. All students take Algebra I in the ninth grade.



If you put me in a level three course, and I've never had level one and two, I'm so totally lost I have no concept of what you're talking about. There's nothing I can do about it.







- Administrator at District E

While students may pass through levels one and two (i.e., pre-algebra K-8 math) substantial skill gaps impede progress in level three (i.e., Algebra I). Some district students may proactively seek help, but **those left with substantial skill gaps disengage**. Though existing within an educational system that often requires Algebra I before students demonstrate readiness, profiled districts take action to promote academic success at this key milestone. **All profiled districts support students' underlying skill gaps through a range of interventions, beginning by using screeners to understand the extent of gaps.**

Administer Online Screeners to Identify Student Skill Gaps and Make Informed Course Placement Decisions

All profiled districts use screeners administered through digital platforms. Profiled districts provide teachers with **instant access to student data**, using a wide array of technology products.

Screeners Used by Profiled Districts

Central Portal	Decentralized Teacher Access	
 <p>MAP and FastBridge via ECRA Group data warehouse and My Students application (District B)</p>	 <p>FastBridge (District A)</p>	 <p>Star 360 (District C)</p>
 <p>State-wide diagnostic and interim assessments via DRC Insight Portal (District D)⁴</p>	 <p>Performance Matters (District E)</p>	 <p>Star 360 (District F)</p>

EAB does not review or recommend any specific products or vendors.

District A uses [FastBridge](#) at the middle and high school levels. District B compiles [MAP](#), [FastBridge](#), [PSAT](#), [SAT](#), and state assessment data (as well as [ACCESS](#) and [LAS Links](#) English and Spanish proficiency tests, as relevant) into its [ECRA Group](#) data warehouse, which teachers access through the associated [My Students](#) application. Placement decisions at District B draw from student ECRA Group data warehouse data, class performance, teacher recommendations, and parent input.

Teachers at District F may immediately access student data through [Star 360](#). At the middle and high school levels, students complete math assessments through [Star 360](#).

4) District D's state department of education partnered with [DRC Insight](#) to develop these offerings.

at least three times per year (i.e., fall, winter, and spring). District F makes placement decisions for Algebra I primarily based on Star 360 data and teacher recommendations. District D uses diagnostic tests and interim benchmarking assessments developed by the state department of education. This suite of assessments includes an associated Chromebook application.

In addition to Star 360 (used three times per year), District C also considers student performance on state standardized tests for Algebra I course placement. High school students do not take the state standardized test. While 10th grade students take the PSAT, and 11th grade students take the SAT, the district lacks data on ninth grade students' academic performance beyond Star 360. Therefore, the district may begin to offer the PSAT to ninth grade students.

Administrators at District C report teachers remain unable to access Star 360 and state assessment data through a single repository. Currently, teachers access Star 360 data through student accounts and state assessment data through a state department of education teacher platform, which facilitates filtering data (e.g., by grade, by question, by student).

District administrators at District E design assessments based on the standards taught by each textbook module. Assessments are administered through [Performance Matters](#), which facilitates data analysis (see the section titled Instructional Practices and Interventions: Skills-Based Instruction below). Administrators **make placement decisions for Algebra I primarily based on state assessment scores and current class performance**. Administrators may also consider teacher recommendations but **caution teacher recommendations may reflect bias**.

EAB's study [Increasing Equity in Accelerated Math Pathways in Middle School](#) advises districts consider multiple criteria to determine student placement into accelerated math pathways. More specifically, EAB's report [Algebra I Placement Strategies](#) finds use of holistic and objective measurements decreases Algebra I placement bias.

Offer Algebra I as a One-Year Course to Maintain High Expectations for Students

All profiled districts **offer Algebra I as a one-year course**. District A is the only district that also offers Algebra I as a two-year course, as well as the only district in which all students begin Algebra I in the eighth grade.⁵

While most districts offer Algebra I exclusively as a one-year course, **no similar consensus emerges regarding Algebra I course scheduling**. Most eighth-grade Algebra I schedules differ from ninth-grade Algebra I schedules in the same district. Block schedules are more common for ninth-grade Algebra I than eighth-grade Algebra I. All Algebra I courses at all profiled districts meet for **an average of at least 200 minutes per week**.

5) Both the one-year and two-year Algebra I courses in District A begin in the eighth grade. Students cannot begin Algebra I in the ninth grade.

Algebra I Courses at Profiled Districts



**200-300
minutes
per week**



Traditional Schedule

- District A (57-58 minutes most days)⁶
- District D ninth grade (one period out of seven per day)⁷
- District F eighth grade (60 minutes per day)
- District C eighth grade (50-55 minutes per day)
- District E (50 minutes per day)



Block Schedule

- District F ninth grade (90 minutes every other day)
- District B eighth grade (one 41-minute block and two 82-minute blocks per week)
- District C ninth grade (one 40-minute block and two 80-minute blocks per week)



Flex-Mod Schedule

- District B ninth grade (10 20-minute mods per week)⁸

However, testimony from academic experts suggests two-year algebra generally remains ineffective. For example, Dr. Uri Treisman, a mathematics professor at the University of Texas at Austin and MacArthur Fellow for STEM education, reports **two-year algebra consistently fails to improve student outcomes**.⁹ While two-year algebra does not appear to be the consistent solution to promoting student success in Algebra I, all profiled districts **offer structured academic support time within the school day** (read more below under the section titled Instructional Practices and Interventions: Tier II).

Curriculum

Consider District Priorities and State Regulations to Inform Curriculum Selection

Most profiled districts that offer Algebra I in both the eighth and ninth grades use the **same curriculum with both groups**. Profiled districts work with no more than two curriculum providers. Contacts at several **profiled districts identify curriculum alignment and standardization as a priority**.

6) District A uses a rotating schedule. District middle and high school students enroll in seven courses. Six courses meet for 57-58 minutes each per day. Courses rotate rather than meet at the same time of day. Algebra I therefore meets six out of every seven school days, at a different time on each of these six days.

7) District D does not offer Algebra I in eighth grade.

8) Read about the flex-mod schedule, which divides the school day into a large number of short "mods" as opposed to fewer, longer class periods, in EAB's report [Flexible High School Scheduling Models](#).

9) Rado, Diane. "Not Many People Noticed, but Lawmakers Just Changed Florida's Graduation Requirements in Math—for Better or Worse," [The Florida Phoenix](#), May 16, 2019.

Algebra I Curricula at Profiled Districts

One Curriculum Provider



[Big Ideas Math](#) (District A)¹⁰



[College Preparatory Mathematics](#) (District F)¹¹



[McGraw Hill](#) (District E)¹²

Two Curriculum Providers



[Illustrative Mathematics](#) (pre-algebra middle school math) and [SpringBoard](#) (District D)



[GO Math!](#)¹³ (pre-algebra middle school math) and [Pearson](#)¹⁴ (District B)



[Progress in Mathematics](#)¹⁵ (pre-algebra middle school math) and [Prentice Hall Mathematics](#) (eighth-grade Algebra I) (District C)

Locally Developed Curriculum



Locally developed ninth-grade Algebra I curriculum (District C)¹⁶

Contacts at District D report its choice of curricula ([Illustrative Mathematics](#) for pre-algebra middle school math and [SpringBoard](#) for Algebra I) meet state requirements to use programs highly rated by the state department of education.

Curriculum alignment remains a work at progress in District A. District administrators hope to align the 6-12 math curriculum with the instructional approach (encouraging conceptual versus algorithmic thinking) employed by the K-5 math curriculum, [Bridges in Mathematics](#) (contingent upon grant funding). Administrators cite [Illustrative Mathematics](#) as a top contender. Administrators at District A also point out

- 10) District A uses Big Ideas Math for grades 6-7. District A uses Bridges in Mathematics for grades K-5. All students in District A start Algebra I in eighth grade. Some students complete the curriculum over two years (i.e., grades 8-9).
- 11) District F offers Algebra I in both eighth and ninth grade. Most district students take Algebra I in eighth grade.
- 12) Most District E students take Algebra I in ninth grade. Parents must approve schedules.
- 13) Some District B students are accelerated in math since sixth grade. The [GO Math!](#) curriculum includes an advanced track for these students.
- 14) Most District B students take Algebra I in ninth grade. Some district students (many of these accelerated since sixth grade) take Algebra I in eighth grade.
- 15) District C uses [i-Ready Classroom Mathematics](#) as the elementary curriculum, which includes fifth grade students even though these students study at the middle school.
- 16) District C also uses [Summit Learning](#) at the high school level.

some teachers currently supplement the [Big Ideas Math](#) curriculum with open educational resources (OER), including those from Illustrative Mathematics.

Administrators at District C await results from piloting [Carnegie Learning](#) and Illustrative Mathematics at the middle school and [Reveal Math](#) and Illustrative Mathematics at the high school. The district aims to standardize curriculum within and between schools. Preliminary feedback from district teachers suggests an increase in rigor with all piloted curricula.

Contacts at District F would like to improve alignment of curriculum with priority math standards set by the district. Administrators at District E remain disappointed with available curricular resources for algebra at lower skill levels and will work to integrate a more hands-on approach into the existing curriculum.

3) Instructional Practices and Interventions

Tier I

Cultivate Positive Attitudes About Math by Using Student-Centered Learning Techniques

Some teachers at District A structure semester-long math projects in Algebra I to **engage students with practical applications of course content**. For example, one district Algebra I teacher leads students in building a house over nine weeks from modeling to construction. Similarly, District C implemented professional development around **project-based learning and cultivating student voice**.

District E **uses small group “math talks” to create a comfortable learning environment** for students to think and talk about math, make mistakes, try new things, and reach higher levels of thinking. Math teachers at District E also use [exit tickets](#) as an opportunity for **regular formative assessment on which to base differentiation and pacing decisions**. Teachers review students’ performance on specific standards and design small group remediation based on this data.

Consider Co-Teaching to Support Universal Access to Algebra I Material

Contacts at District E report some Algebra I classrooms include co-teaching, depending on the number of special education students in the class. However, contacts report co-teaching efficacy in supporting student learning varies as district special education teachers’ knowledge of Algebra I concepts also varies, with some teachers learning along with the students instead of actively co-teaching.

For additional information on the co-teacher role, see EAB’s report [Universal Design for Learning and Other Inclusive Practices](#).

Potential Algebra I Co-Teacher Responsibilities



Skills-Based Instruction

Facilitate Teacher Data-Driven Decision Making for Math Interventions and Course Placements Through Easily Accessible Data and Structured Review Processes

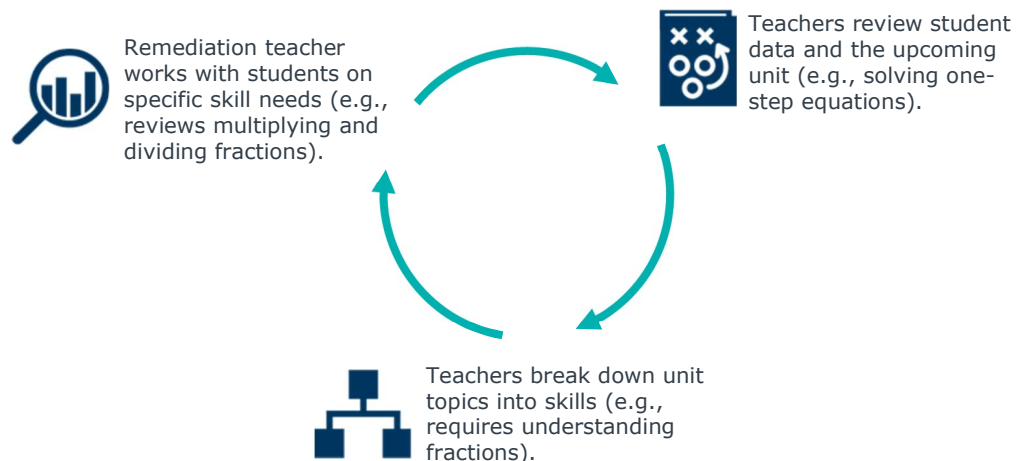
When teachers at District B review results from common summative assessments in their Professional Learning Communities (PLCs), they also review students' data (e.g., screener data, state assessment results) through the My Students application to better understand skill gaps. Additionally, the district's gifted education and curriculum coordinators **facilitate formal data reviews** in January and May for preliminary and finalized course placements for the next academic year. Teachers, guidance counselors, and building administrators participate in these data reviews. District B **trains teachers annually** in using My Students and the ECRA Group data warehouse as well as in making data-driven decisions.

Profiled districts mention data limitations arising from the COVID-19 pandemic. Administrators at District E in particular report they did not receive state assessment data for several years and consider previous data now outdated due to pandemic-related learning loss.

In addition to data from state department of education-developed screeners and benchmarking assessments, District D teachers also receive real-time data from the Edulastic application which they use to **alter daily instruction, conducting interventions as needed**. Similarly, District A introduced Formative for its middle school teachers to determine when to conduct interventions.

District E math teachers access "classrooms" within the [ALEKS](#) self-paced learning system for data on their students. Teachers receive reports directly from the ALEKS system. Math teachers at both the middle and high school level also meet with the math facilitator (i.e., instructional coach) at least once per month to discuss ALEKS and unit assessment data. At the middle schools and one high school, a remediation teacher joins these conversations. The remediation teacher **then develops pull-out interventions to address specific skill gaps** with students.

Skills-Based Math Remediation at District E Middle Schools



Further, **consider communication technology to empower students seeking support**. Students at District E may reach out to teachers for additional help through the [Remind](#) application. Through Remind, students may contact teachers for additional help on a specific topic. District D also uses this technology.

Implement Skills-Based Grouping to Address Underlying Skill Gaps

Skills-based grouping is a method of small group instruction that is proven to accelerate reading and math progress for all students. Rather than grouping students by generic achievement levels or composite scores for small group instruction, this approach **groups students by specific skill gaps and targets instruction** to address each skill.¹⁷

Both District C and District D report COVID-19 social distancing protocols limit group work in the classroom.

District C uses skills-based grouping in the classroom, with varying consistency. District administrators report not all teachers understand skills-based grouping well enough to implement the practice in a classroom setting. Similarly, some elementary school teachers in feeder districts to District A use skills-based grouping, but this does not characterize practice across District A and other associated districts. Math teachers in District B also use skills-based grouping during intervention time at the end of each class. While these examples highlight skills-based grouping in practice with the entire class, profiled districts also use skills-based grouping for Tier II instruction.

Consider Self-Paced Learning to Address Gaps in Foundational Skills While Collecting Additional Student Data

As a response to the COVID-19 pandemic, students at District D attend regularly scheduled, in-person classes from Monday through Thursday. On Fridays, most students remain at home, completing **self-paced learning exercises** through [Edgenuity to address specific skill gaps](#). Hard copy packets are specially made for students lacking internet access at home. Further, students needing intensive support may still meet teachers in-person for additional help on Fridays.

Grade 6-12 students at District E use ALEKS, a self-paced learning system which serves both as a complement to classroom instruction as well as a way to fill in gaps, such as staffing shortages. Students complete an initial knowledge check as well as additional knowledge checks as they complete modules. District contacts would like to use ALEKS at least once per week in math classes, but current practices remain inconsistent. Students may work on ALEKS modules during class or as homework. Similarly, Formative at District A offers students self-paced learning while providing data to teachers on student skills.

Tier II

Use Push-In Intervention to Maximize Class Time

All students in math classes at District E middle schools receive remediation on Tuesdays (one-on-one, small group instruction). Rather than introduce new materials, classroom teachers **provide remediation for recently learned skills** (versus pre-existing skill gaps).

Middle and high school math teachers in District B **incorporate intervention time at the end of class** and use skills-based grouping to structure this time. At the high school level, Algebra I students may “flex in” or “flex out” of a dedicated 20-minute mod that occurs after a three-mod (60-minute) lesson, according to a sample schedule shared by district administrators. Students who “flex in” stay in the classroom for skills-based remediation and homework help. Students who “flex out”

17) See EAB's [Scaling Skills Based Grouping in Core Subjects](#) resource.

may leave the classroom and work on Algebra I homework or focus on other assignments. This flex time may be understood as Tier II given all students do not participate in math remediation during this time.

Example Flex-Mod Algebra I Schedule

	Monday	Tuesday	Wednesday	Thursday	Friday
20 minutes					
40 minutes					
60 minutes					
80 minutes		Flex Time			





Use Pull-Out Intervention to Provide Consistent, Intensive Support

See EAB's report [Integrated Academic Support Time](#) for implementation guidance.

All six profiled districts offer supplemental academic support time structured into the school day. EAB research finds districts should **integrate time for individualized academic support into the daily academic schedule** to increase access to support services.¹⁸

18) See EAB's study [Improving Academic Outcomes for Middle School Students](#).

Types of Academic Support Periods at Profiled Districts

 <h3>Tailored Course</h3> <ul style="list-style-type: none">• Intervention Algebra I course for 90 minutes per day (District F)¹⁹	 <h3>Supplemental Math Period</h3> <ul style="list-style-type: none">• Pre-algebra middle school math support period (District A)• Algebra I support period (District A)• Ninth-grade Algebra I support period (District D)²⁰• Extended math period for pre-algebra middle school math (District D)
 <h3>General Intervention</h3> <ul style="list-style-type: none">• 50 minutes every other day for middle school math (District E)• 60-minute intervention period for middle school math (District F)• General academic support period (District A)	 <h3>School-Day Credit Recovery</h3> <ul style="list-style-type: none">• General tutoring and credit recovery period (District C)²¹

District A students may enroll in a pre-algebra middle school math or Algebra I support period for math specific intervention. The district also offers a specific support class to help students develop academic skills. While not devoted solely to math, in practice, this course focuses heavily on math. The district limits this class to fewer than 10 students per session. Students may be placed into this course by guidance counselor or teacher recommendation as well as student or parent request (parents may also contend placement decisions). Students may move into this course during the year if they begin to struggle academically, provided their schedule allows. Administrators at District A note scheduling can limit support offerings in small districts, a concern echoed by other profiled districts.

Students in District F middle schools may enroll in a 60-minute intervention period rather than an elective. At the high school level, students may enroll in the district's intervention Algebra I course, which meets for 90 minutes per day (i.e., double-period course in a block schedule) rather than 90 minutes every other day (i.e., single-period course in a block schedule). The district reserves this intervention version of Algebra I for students that already demonstrate need for significant support. Students may not enroll into this course mid-year if they begin to struggle in Algebra I. Research suggests while double-period Algebra I may only modestly improve class performance, **students may experience longer-term benefits from associated academic skill development, including improved performance in**

19) The standard Algebra I course offered at District F meets for 90 minutes every other day.

20) All Algebra I students in District D take this course.

21) While District C now offers an intervention period at the high school level (a new initiative for the 2021-2022 academic year), this course primarily serves students in tenth grade and above who failed previous courses (not exclusively math), or struggle based on Star 360 results or previous class grades. Ninth grade students primarily attend tutoring for support.

subsequent courses, increased college graduation rates, and higher ACT scores.²²

Further highlighting the importance of providing structured support for Algebra I during the school year, contacts at District F plan to improve identification of student need for Tier II intervention and provide additional opportunities for such support (e.g., by introducing common district assessments). Contacts would like to offer a standalone intervention period at the high school level as well as facilitate students' flexibility in enrolling and disenrolling from this period as needed. However, the district currently faces scheduling constraints.

All ninth grade students in District D take two one-year math courses: Algebra I and an accompanying support period that addresses student skill gaps. Class sizes for these courses vary based on student needs. For example, the district may place students struggling in math in classes with 10-14 students rather than classes of 20-22 students. District D also introduced a year-round school calendar in 2020-2021 to address unfinished learning concerns arising from the COVID-19 pandemic and now offers eight-week terms followed by two-week breaks. During one week of the two-week breaks, teachers offer small group, intensive academic support.

District C places middle school students into an intervention based primarily on Star 360 data and state assessment results. Classroom data (e.g., unit tests) and teacher recommendations remain a secondary consideration. Students may enroll in an intervention period from the beginning of the school year or transition into an intervention period part-way through. District C administrators report the district would like to serve more students through intervention periods, but scheduling and staffing constraints remain. The district will be introducing a new schedule for the middle school next year. Administrators will **prioritize access to intervention periods** when designing this schedule.

District E places middle school students into an intervention period primarily based on previous grades. Placement decisions may include teacher recommendations. Students remain in the intervention course for a quarter and may only enroll at the beginning of the quarter. While District B does not offer a designated academic support class, district teachers instead invite students to work with them during either their homeroom or the school-wide common study period.

District B also focuses on **addressing specific skill gaps through its Tier II interventions**, determined by a **building-level problem-solving team** consisting of a social worker, guidance counselor, and classroom teacher(s). Special education teachers join these meetings for students they support.

22) Cortes, Kalena, Joshua Goodman, and Takako Nomi. "A Double Dose of Algebra," [Education Next](#), Dec. 15, 2012.

Example Building Problem-Solving Team at District B



Teacher



Guidance counselor



Social worker



Special education teacher

Referrals for intervention support and extension

Offer a Range of Tutoring Options to Meet Individual Student Schedule Needs

EAB recommends high-intensity tutoring as highlighted in the [Learning Recovery Resource Center](#).

Teachers at District C refer students struggling with math to afterschool tutoring. However, district administrators found many students did not attend the program. District C therefore introduced a **high-intensity tutoring program** (currently in the pilot stage) at the middle school level. This program narrowly targets students, who work in small groups of 4-5 students per teacher. Teachers provide explicit instruction on math skills. Star 360 and state assessment results inform teacher practice.

District E offers both formal and informal tutoring options. Formal afterschool tutoring meets for two hours on Tuesdays, Wednesdays, and Thursdays and covers all content areas, including math. Administrators note afterschool tutoring focuses on recently learned skills rather than gaps in foundational skills. Math teachers at District E often informally tutor students before, during (e.g., lunch, planning time), and after school.

Both middle and high schools in District F offer general afterschool tutoring. At one high school, math teachers stay after school to provide support Mondays through Thursday. Middle and high school teachers in District A must offer at least an hour for afterschool support. District B offers skills-based Tier II intervention through informal tutoring. Math teachers request students join them for support during open times (e.g., homeroom) when students and teachers remain free.

Offer Credit Recovery to Prevent Algebra I Roadblocks

District A **offers a summer credit recovery program**. While not math-specific, Algebra I credit recovery remains a common theme. Further, the district offers a school-based transition program mainly for students returning from medical leave. District C offers a **credit recovery course during the school day**, partially as a response to low student attendance at afterschool tutoring.

Administrators report students at District E may repeat Algebra I 2-3 times. The district also offers credit recovery in the summer. However, administrators note summer credit recovery programs remain far from a panacea, with a 180-day school year condensed into a 30-45 day program. The district does not offer a standardized summer program to all students. Instead, individual instructors determine content and do not individualize the program of study based on student needs. Structure also varies—students attend a two-hour program either four or five days per week for 6-9 weeks. District administrators report some students succeed in this environment whereas others continue struggling.

4) Professional Collaboration and Development

Common Planning Time

Schedule Common Planning Time Intentionally to Better Facilitate Professional Collaboration

Middle and high school math teachers at District E meet at least once per month to discuss student data with the math facilitator (i.e., instructional coach). High school math teachers do not have common planning time, so this meeting occurs outside the school day. Teachers may collaborate on an informal basis. However, at the middle school level this meeting occurs during common planning time as part of the school day. Middle school math teachers also meet weekly in grade-level groups to plan the week's lessons. Accordingly, districts may **prepare for success by intentionally designing common planning time**. Administrators at District E enjoy observing middle school math lessons emerging from common planning time:



I love observing all on the same day because I'm going to see the same lesson, but I'm going to see it adjusted for [the teachers] and for their students.

- Administrator at District E

Additionally, three profiled districts set regular time for Professional Learning Communities (PLCs) to meet. At District C, middle school "cluster" teachers (core subject teachers who instruct a common set of students by grade level) receive 50 minutes per week of common planning time. However, District C finds lack of common planning time for departments at the middle school level a limitation. At the high school, ninth-grade math teachers meet as a department as well as in clusters. Thus, **consider different configurations of professional grouping to meet district needs**.

Administrators at District A observe resistance among teachers, particularly at the high school, as they attempt to shift from an algorithmic to an inquiry-based instructional framework. In contrast, while District C struggles with consistency in PLC implementation, administrators report teachers express appreciation and the desire for additional professional development. Similarly, administrators at District E recognize the district boasts many committed math teachers. However, this constrains opportunities for professional development because teachers tutor after school and administrators do not want to take them out of the classroom for professional development. Therefore, **consider local context** when planning collaboration.

Consider Implementing Professional Learning Communities (PLCs) to Standardize Effective Practices

Three profiled districts structure common planning times as PLCs. PLCs at District C enjoy meeting time built into the schedule. Topics include differentiation and skills-based grouping. Middle school teachers meet as clusters. Ninth grade Algebra I teachers meet as clusters as well as with other building math teachers.

See EAB's report [Professional Learning Communities](#) for guidance on PLC implementation. EAB recommends districts implement evidence-based PLC models with fidelity for student achievement gains.

District B builds planning for teachers into the daily schedule. Grade-level PLCs meet 1-2 days per week during this time. Some teachers may also meet with department PLCs. PLCs may occasionally meet during early releases, time the district also uses for professional development sessions. PLCs review student data from the ECRA Group data warehouse (i.e., screener results, state assessment scores) and common summative assessments to determine students at the 25th percentile and below. Teachers identify student skill gaps, as well as applicable language gaps, to design interventions for these students.

PLCs at District D meet for one hour per week. Math teachers review the results of common formative assessments to identify student strengths and weaknesses.

Professional Development

Focus Professional Development on Instructional Practices Rather Than Math Content Alone for Lasting Change

All profiled districts **focus professional development on instructional practices**. Contacts report professional development in District C currently **focuses on the science of reading and cultural proficiency**. As part of the district's ongoing curriculum review process, teachers also received trainings on instructional practices from curriculum providers. Additionally, elementary math teachers received coaching on unpacking (mapping and pacing) a unit from the district's current elementary math curriculum provider. Administrators at District C note math teachers need further training on differentiation as the district experiences a wide range of achievement levels in classes and an increasing number of English language learners (ELLs).

Similarly, math teachers at District F recently received professional development from the district's curriculum provider, [College Preparatory Mathematics](#). Topics presented vary (e.g., one recent session focused on virtual instruction). SpringBoard led professional development for Algebra I teachers at District D. District E offers a week of professional development every summer on instruction, influenced by the state department of education. For example, last year district teachers work at aligning assessments with newly-release state performance level descriptors. Administrators at District B also report professional development, typically led by instructional coaches, focuses on general instructional practices rather than subject content.

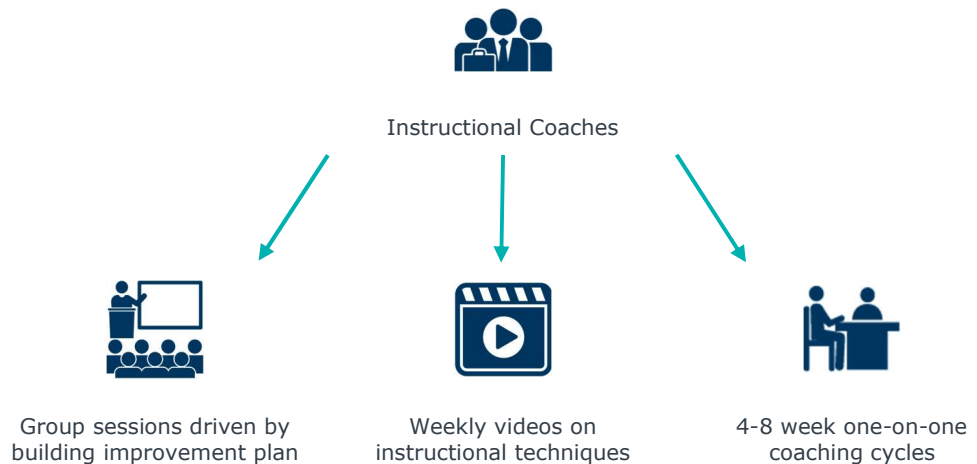
District A contracted with a math professor from a local university for professional development training for its middle and high school math teachers. This training focused on shifting algorithmic instruction to conceptual, inquiry-based instruction. This program centered on **general instructional practices rather than math content knowledge**. However, the professor highlighted examples of incorporating these instructional practices into subject-specific math classes (e.g., algebra, geometry).

Incorporate Instructional Coaching as a Core Pillar of Teacher Professional Development to Promote Continuous Improvement

Five profiled districts discuss working with coaches to **improve math instruction through cycles of observation and feedback**. Profiled districts use both external and internal coaches. In District D, middle school math teachers work with LearnZillion coaches who observe their classes and debrief with them. The local math professor who worked with District A directly modeled inquiry-based instructional practices throughout her professional development sessions for district math teachers, in addition to observing teachers' classes and providing feedback. Additionally, while District C does not currently employ instructional coaches, administrators would like to add ongoing coaching to professional development offerings. Previously, teachers worked with an external coach on a limited basis.

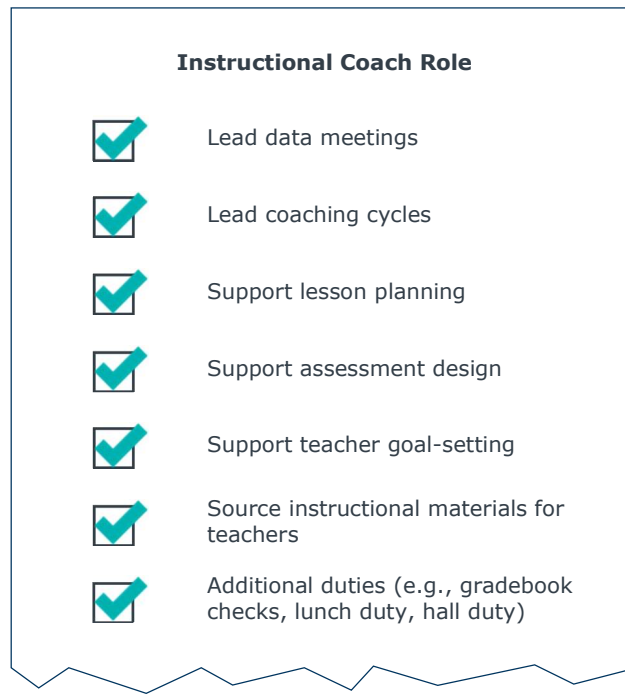
District instructional coaches at District B lead group professional development sessions, publish weekly videos on instructional techniques, and work with individual math teachers for 4-8 week coaching cycles. Contacts at this district emphasize the effort coaches exert **to build relationships with teachers prior to coaching cycles**, as cycles remain teacher-initiated. District B administrators highlight the importance of ensuring cycles are confidential and not perceived as punitive. Coaching cycles generally **focus on instructional and engagement strategies rather than specific content**. These cycles include observations, modeling, and debriefs.

Instructional Coach Responsibilities at District B



Building improvement plans drive professional development topics at District B. Building administrators and teacher leaders (often PLC leads) develop SMART goals for the improvement plan based on student data from the ECRA Group data warehouse. Similarly, math facilitators (i.e., content-specific instructional coaches) at District E take responsibility for a variety of tasks, including coaching cycles.

Instructional Coaches at District E



Consider Developing Partnerships to Leverage Community Resources

Profiled districts leverage both community knowledge and financial resources. Prior to the onset of the COVID-19 pandemic, District A **worked with a local math professor to provide professional development** for district middle and high school math teachers. Administrators at District A hope to receive grant funding to restart this program as well as pay teachers for additional professional development hours.

Similarly, ninth grade clusters at District C **work with a nearby public charter school** that adheres to the Coalition of Essential School's Common Principles.²³ Training focuses on instructional practices, particularly **cultivating student voice and project-based learning**. This is a multi-year project currently in the third year. District C also **works with a community partner for its pilot high-intensity tutoring program**, which enables the district to provide attendance incentives (i.e., transportation and snacks).

23) The Coalition of Essential Schools ceased operations in 2017, schools continue to embrace the Common Principles. ("About CES," [Coalition of Essential Schools](#).)

5) Research Methodology

Project Challenges

Leadership at a partner district approached the Forum with the following questions:

- What assessments/screeners (e.g., paper-based, computer-based) do contact districts administer to diagnose student skill gaps before and during Algebra I?
- What curriculum and course progressions do contact districts use to prepare students in pre-Algebra I math (e.g., seventh grade, eighth grade) to meet proficiency expectations (i.e., state standards) for Algebra I success?
- What curriculum do contact districts use for Algebra I?
 - Does curriculum differ by grade level (e.g., eighth grade, ninth grade)?
- How do contact districts structure the Algebra I class and course (e.g., single period, double period, 1 year, 1.5 years)?
 - Does structure differ by grade level (e.g., eighth grade, ninth grade)?
- What support services do contact districts offer students in pre-Algebra I math and Algebra I?
 - Do contact districts provide additional school time to support Algebra I students?
- What Tier I/Tier II interventions do contact districts use to support students in pre-Algebra I math (e.g., seventh grade, eighth grade)?
- What Tier I/Tier II interventions do contact districts use to support Algebra I students who fail to meet proficiency expectations (i.e., state standards)?
 - Do these practices differ by grade level (e.g., eighth grade, ninth grade)?
- How do contact districts effectively apply skills-based grouping to Tier I Algebra I instruction (e.g., eighth grade, ninth grade)?
- What professional development opportunities do contact districts provide for teachers teaching pre-Algebra I math and how are they structured?
- What professional development opportunities do contact districts provide for teachers teaching Algebra I and how are they structured?

Project Sources

The Forum consulted the following sources for this report:

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Research Parameters

Profiled Districts

District	Location	Approximate Enrollment
District A	Northeast	500 students
District B	Midwest	2,500 students
District C	Northeast	2,000 students
District D	South	1,500 students
District E	Mid-Atlantic	3,000 students
District F	Mountain West	7,500 students