Middle School Math Curriculum

Findings from Year 1 of a Three-Year Study of the implementation of *enVisionMath2.0* ("enVision")

Seattle Public Schools

Research & Evaluation Department

October 2019

Middle School Mathematics Curriculum

(enVisionMath2.0 or "enVision")

Background

In 2018, the School Board approved a $2 million investment in *enVisionmath2.0* ("enVision"), a textbook and associated materials for students learning math content for grades 6-8.

Research & Evaluation (R&E) is partnering with Curriculum, Assessment & Instruction (CAI) in a three-year review of the curriculum. These findings are from 2018-19, which is Year 1 of the study.

SEATTLE PUBLIC SCHOOLS

Research Questions

- What can we learn from the implementation of enVision that informs both this and future district curriculum adoptions?
- To what extent is the enVision instructional materials adoption causing educators to shift practices in service of student achievement and eliminating opportunity gaps?

SEATTLE PUBLIC SCHOOLS

Theory of Action

IF

We provide access to high-quality, standards-aligned, rigorous, coherent middle school math instructional materials; and

We provide coordinated, robust professional development to teachers and principals; and

We identify at least one person in each school who will help guide implementation…

THEN

Principals and identified school staff will become "lead learners" who support teachers' ability to grow in their beliefs and practice;

Teachers will implement enVision using high-quality, equity-based teaching practices; and

ALL students will perceive themselves as capable and proficient mathematicians demonstrating deep understanding of math standards

SO THAT

The opportunity gap in math is eliminated and students enter high school prepared to be successful on their college, career, and life math pathway.

SEATTLE PUBLIC SCHOOLS

Logic Model

Adoption Materials and Resources

Deliver enVision Math 2.0 "as intended"

Instructional Materials

- *Teachers consistently use enVision materials/framework in the classroom*
- *School leaders provide clear communication to staff, as well as opportunities for staff to collaboratively plan implementation*

Professional learning

Teachers, leaders and identified staff attend coordinated professional learning sessions, engage in cooperative learning (e.g. in learning walks, PLCs)

Formative Assessments

Teachers use data from a wide range of grade-level assessments – including District Interim Assessments – to guide instruction of enVision

Teacher and Leader Shifts

School leaders and identified school staff are empowered as "lead learners"

Perception data (surveys, interviews)

↓

Teachers shift to student-centered, equity-based teaching practices with opportunities for students to explore math for deep conceptual understanding

- *Classroom observations*
- *Perception data (surveys, focus groups) – including student voice*
- *Interim Assessment data*

Student Outcomes

Students are engaged, motivated math learners

- *Classroom observations*
- *Perception data (surveys, focus groups) – including student voice*

Students achieve at high levels in mathematics

- *SBA proficiency, growth by 8th grade*
- *Access to and success in Algebra I by 8th grade*
- *Gap elimination for underserved students, ELL students, students with disabilities*

Impact

More students – particularly underserved students – access and successfully complete advanced HS math courses

HS course-taking patterns
Course completion, GPA

↓

Students graduate ready for STEM-based college courses, career and technical trades

Graduation rate trends
Postsecondary data trends (NSC)

Supports and Resources

- *"Taught as Intended" expectations*
- *CAI staff*
- *Board approved funding*
- *Continuous improvement study from Research & Evaluation*
- *Dedicated professional development time*

Findings Summary

This presentation highlights findings from Year 1.
We are currently collecting data for Year 2.

Year 1
(2018-19)

- **Teachers use and appreciate the materials, even as they make changes to fit their classroom contexts**
- **More PD needed on student discourse strategies, encouraging "productive struggle" in math**
- **"Implementation dip" in test scores (7th grade proficiency)**
- **Existing and planned district investments based on Year 1 findings**

Year 2
(2019-20)

and

Year 3
(2020-21)

- Alignment to Seattle Excellence focus on students of color furthest from educational justice, in particular African American males
- More focused data analyses of interim and summative test data

Data Collection and Analysis

Surveys

Teachers: February 2019,
89 respondents
(response rate: approx. 60%)

Site visits

Interviews with teachers, students, and leaders at:

- Hazel Wolf K-8
- Mercer Middle School
- Jane Addams Middle School
- Eckstein Middle School

Student-level data analyses

Smarter Balanced Assessments (SBA)

Study Limitations

Survey findings are self-report data from teachers who teach students learning math content for grades 6-8.

Findings represent the experience of teachers who teach middle school math content (i.e. not the experience of teaching high school-level courses in middle school). There are approximately 105 middle school and 39 elementary teachers who fall into this category.

Site visit findings may not be representative of the experiences of all teachers, students, and leaders.

Schools were selected based on:

- Reported levels of implementation (as reported on 2019 Teacher Survey)
- Demographics of student body (to ensure representativeness of the district)
- School type (to include both K-8 and comprehensive middle schools)

Data analyses are still in progress and are descriptive only; they do not present causal claims about curriculum effectiveness.

Future analyses may focus on:

- Further SBA analysis, including student growth, claim level analyses
- In-depth looks at progress monitoring data (SBA Interim Assessments)
- Further disaggregation (e.g. ELL, SPED, Advanced Learning)

Improving Implementation

Feedback from teachers, leaders, and students focused on the following:

- Alignment to beliefs about math instruction
- Frequency of use of the materials
- Curriculum elements, structure, cultural relevance
- Pedagogical shifts and student discourse strategies
- Professional learning and instructional leadership
- Assessments
- Perceptions of student outcomes

SEATTLE PUBLIC SCHOOLS

Implementation Findings

Finding 1: Teachers and leaders believe that enVision fits well with their beliefs about what effective math instruction should look like in middle school. The disconnect is the lack of aligned strategies in elementary grades.

In the 2019 teacher survey, **60% of all teacher respondents (n=89) reported that enVision's instructional approach is "consistent with my personal beliefs about effective teaching."**

"I believe that the approach is effective. Where I'm not the holder of the knowledge, that we are creating this knowledge together. I think it's very effective.– School leader

In site visits, teachers noted that, although curriculum adoption alone is not a complete approach to instructional improvement, there is a very real **lack of alignment in elementary school curriculum**, which makes enVision's instructional approach seem disjointed and uncomfortable for many students.

"There must be a way to better prepare them. In the sense of using the same vocabulary, same models, same teacher moves, so that there is just better preparation coming to sixth grade so that we can get to more preparation for seventh grade." – Teacher

SEATTLE PUBLIC SCHOOLS

Implementation Findings

Finding 2: Over half of teachers report they are using the enVision materials "as intended" as their Tier 1 curriculum for mathematics.

Using self-report data from the 2019 Teacher Survey, we found that **60% of teachers are teaching the curriculum "as intended."***

"Taught as Intended" Definition

1. Following the scope and sequence of the enVision lessons as detailed in the Teacher's Edition
2. Consistently and regularly using the textbook and accompanying online resources
3. Not supplanting envision with other instructional materials as the primary math resource for class

*Note: "Taught as Intended" calculated by asking teachers to report the frequency of use of various components of the curriculum, and mapping responses onto expectations as spelled out in the Teachers Edition. Calculations omit data from teachers who did not fully respond to elements of all "taught as intended" questions.

SEATTLE PUBLIC SCHOOLS

Implementation Findings

Finding 3: School leaders support implementation by making clear the expectation that teachers use the curriculum consistently, but also providing flexibility as staff and leaders become familiar with the new materials and instructional strategies.

In interviews, school leaders say that their messaging around implementation acknowledges that enVision allows teachers to focus less on curriculum writing and instead focus on instructional practices

To support implementation, school leaders:

- **Provided targeted flexibility** to teachers to adjust to new curriculum, for example focusing efforts on specific grade levels within the school.
- **Made changes to staffing assignments** to support peer coaching and intervention support in light of the new curriculum.
- **Brought in additional resources** and frameworks, which apply to their implementation of enVision as well.

"I just hired [a SPED interventionist] and I'm really excited about it, who knows enVision really well. It's really important to have a strong partnership in that co-taught class." – School Leader

The [University of Washington leadership training] was and continues to be the work around what do we want the math experience of our students to be? How do we achieve that? What do we as the teachers need to do, and the instructional leaders need to do? It's kind of, you know choosing specific instructional strategies to really home in on and focus on." – School Leader

Implementation Findings

Finding 4: Teachers have run into practical implementation issues as they adjust to the new materials.

In site visits, teachers noted issues with:

Pacing – Teachers say that the curriculum doesn't build in enough practice, which slows down instruction and gets teachers off track of scope and sequence. Students also report feeling stress due to pacing issues.

"Materials management"– Teachers want technical guidance on methods for note-taking, creating worksheet binders, where to leave the textbooks, etc. Teachers also note that there's not enough space for students to do and show their work.

"Content overload" – The wealth of materials can be overwhelming, which has led to spotty implementation of certain components – for example Three-Act-Tasks and technology-based components

"There were times where I was like, oh, some of the kids still don't get this, but we have to keep moving because we're not going to get through everything and most of the kids get it. So that's been the hard part." – Teacher

"We have to take the state exams and we've only gotten halfway through our math unit. And that's kind of stressful because we're gonna start it soon and it's gonna be crammed." – Student

"There's some lessons that we walk in there, and there's just too much paper. You've got to whittle this down. That's just too much." – School Leader

SEATTLE PUBLIC SCHOOLS

Implementation Findings

Finding 5: Teachers and leaders generally agree that the curriculum is designed to push students toward deeper levels of thinking but provide mixed feedback on the degree to which the curriculum meets the needs of particular students.

On the one hand, teachers say that **enVision assumes too much prior knowledge** and doesn't always provide a good entry point for below-grade level learners.

"It's not a great entry point for most of our students. The language is a little hard. The vocabulary is tough. Many of our kids struggle with just the basic concepts and procedures." – Teacher

"We see that that piece is missing from enVision is that it's a chunk and then it moves on to the next chunk and there isn't that scaffolding of prior concepts woven throughout to remind students how to use Algebra because it's going to show up again later in another unit and in another concept." – Teacher

On the other hand, teachers say that **the rigor may not always be high enough** to engage and challenge students, and that **some problems are overly-scaffolded**.

"I don't know if the enrichment is actually enriching enough." – Teacher

"The enVision materials are overly scaffolded. It's like giving it away almost. The book seems to be doing the work or the resources seem to be doing the work in a lot of ways." – Teacher

SEATTLE PUBLIC SCHOOLS

Implementation Findings

Finding 6: In response to noted issues with implementation, teachers supplement and tweak the curriculum to make it fit their classroom needs

In the 2019 Teacher Survey, **81% of teachers (n=89) said they supplement *outside* of enVision**

In site visits, teachers elaborated on the types of modifications they are making to enVision. Strategies ranged by topic and expected impact on student learning – most fit into the "medium" category.*

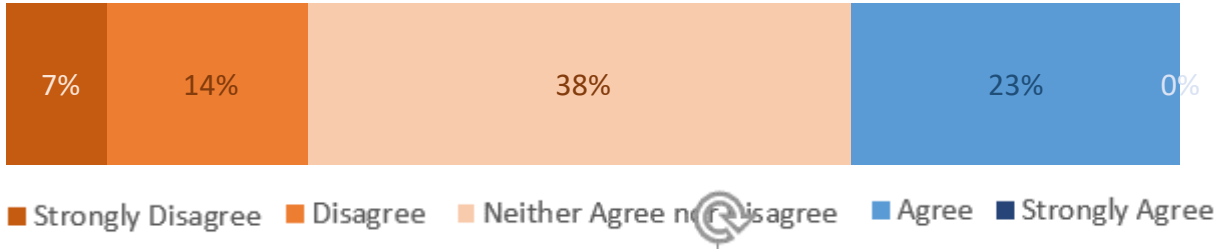
LOW	MEDIUM	HIGH
Skipping enVision elements to move faster	Adding practice after "Day 2" for review	Rewriting workbook examples to avoid overscaffolding
Finding additional worksheets online for advanced learners	Rewriting or condensing assessments	Using online SBA practice tools
Eliminating higher order thinking problems for students with IEPs	Providing online homework access	Adapting lessons together as a teaching team
	Additional scaffolding for SPED	Rewording questions to make relatable to students
	Having students serve as peer coaches	
	Adding practice, warm-up problems	
	Providing positive behavior incentives for student discourse	

*Categories created and strategies sorted by SPS Curriculum, Assessment and Instruction staff

Implementation Findings

Finding 7: Teachers are unsure how to evaluate the cultural relevance of the instructional materials, but note that enVision problems are generally relatable to real world experiences of students.

Of survey respondents, **23% of teachers agreed that "the enVision textual materials are culturally and ethnically relevant," but 38% responded neutrally.**



In site visits, students, teachers and leaders noted **that the problems in enVision are relatable to students' daily lives and lived experiences**.

"I really do like this curriculum, there's a lot of connections to real life. The 'why do you need this math' piece -- and kids see that." -- Teacher

"There's opportunities for kids to bring their own schema to mathematics to make better sense of it. So I was excited about that piece of the new curriculum." – School Leader

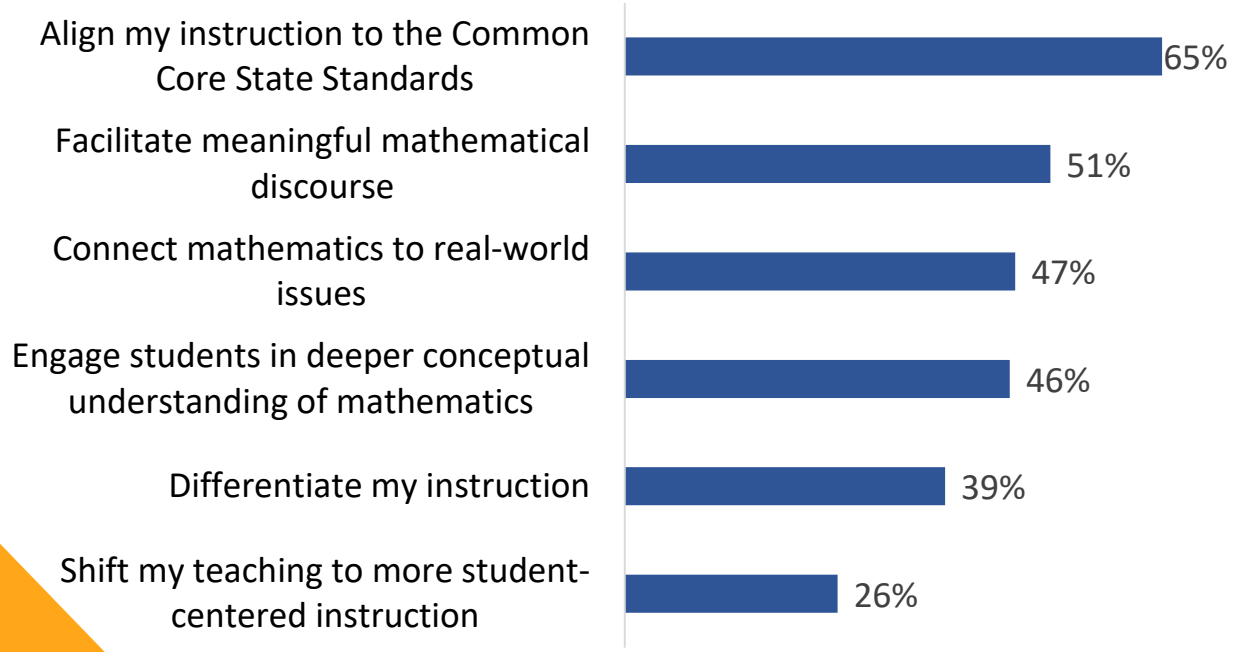
"The word problems – there's a lot of them. And they relate to your real life." – Student

SEATTLE PUBLIC SCHOOLS

Implementation Findings

Finding 8: Teachers believe that using enVision helps them to align instruction to standards, but cite other areas of instructional practice where they need additional support.

2019 Teacher Survey responses to: "Using enVision has helped me to…"



In site visits, teachers and leaders note **shifts this past year toward high quality, equity-focused instructional approaches**.

Whereas some teachers attribute this to the instructional materials adoption, others said that **these are shifts they have been working on for a while**, and that enVision's contribution is that it allows them to concentrate more on techniques and less on curriculum design.

Implementation Findings

Finding 9: Teachers and leaders appreciate the curriculum's focus on student discourse but noted student discourse strategies as an area of professional growth for next year.

In site visits, teachers and leaders say they'd like additional training on student discourse, including:

- **Strategies for encouraging whole group discussion**
- **Engaging reluctant learners**
- **Encouraging students to feel safe making mistakes**
- **Balancing pacing needs with high quality student discourse**

"When done right, I believe that that productive dialogue and that productive struggle is what it's going to take to close the opportunity gap. The problem for me, is when it's done wrong, you've really gone off the edge of the hill. There's no in between in something like this." – School Leader

"I do feel like I'm more interactive with the students...But I don't feel like I'm doing so much more work, that it's overwhelming. It's more in a better way." – Teacher

"But I'm still trying to pull in what the enVision wants us to do with the student discourse thing. But I do know I need to do better on that next year." – Teacher

Implementation Findings

Finding 10: Students underscored the importance of establishing clear expectations for student discourse so that they feel both safe and respected in the classroom community.

In site visits, students said that they **appreciate working in groups** and talking about math because it allows them to learn from their peers.

That said, they also talked about how important it is to **create a classroom environment where students feel safe to learn from mistakes** and aren't expected to know the answer right away.

They also talked about the importance of **establishing classroom expectations and routines for collaborative learning**.

"So last year I didn't talk as much to people, I just did my own work and finished it. But this year, I actually had time to talk with people and tell them, "Oh, that's not right" or "Wait, that doesn't make sense" or stuff like that. That's more helpful than just doing the worksheet and getting the work done, in my opinion." – Student

"My teacher is very humble, so if she makes a mistake and you can point it out then she'll show you why she did it wrong and then if anybody else did it the same way then we learn through that." – Student

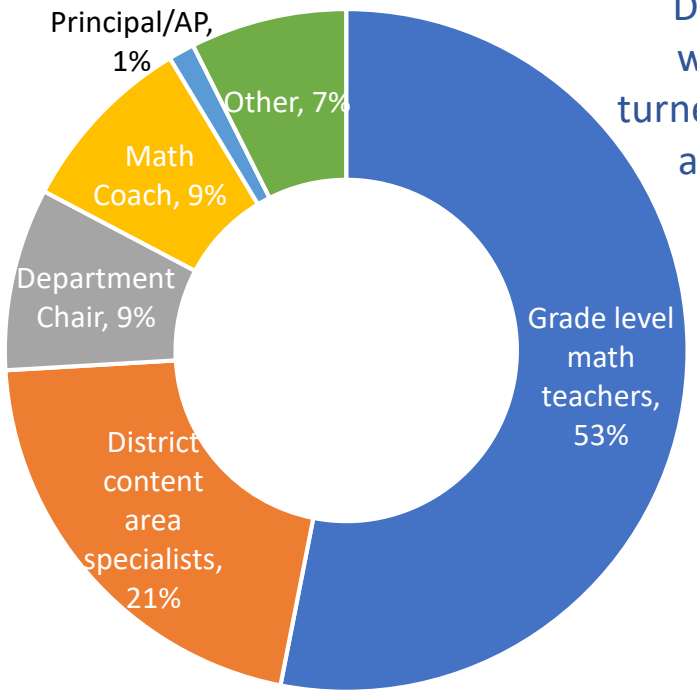
"There's a lot of people in my class who don't take it very seriously and it's a bit annoying because our teacher doesn't really care if we're on task or off task." – Student

SEATTLE PUBLIC SCHOOLS

Implementation Findings

Finding 11: Teachers primarily lean on grade-level peers for support with implementation, but also value supports from district curriculum specialists and other in-school mathematics resources (e.g. coaches).

On the 2019 teacher surveys, **over half of teachers say that their peers are the primary person they turn to for advice or information about teaching enVision.**



During this school year, to whom have you primarily turned for advice or information about teaching enVision?

In site visits, **teachers report working with colleagues in PLCs** to co-plan and share what works with the curriculum. They also highly value supports they receive in the form of coaching/mentoring/technical assistance from the **district curriculum specialists**

SEATTLE PUBLIC SCHOOLS

Implementation Findings

Finding 12: Teachers want more opportunities to observe classroom instruction using enVision.

On the 2019 teacher survey (n=68), teachers said they would like the following professional development:

Going on learning walks to observe lessons from my colleagues (60%)
Planning, reflecting on, and/or reviewing enVision materials in PLCs (50%)
Receiving feedback following walk-throughs of my enVision classroom lessons (40%)

In site visits, teachers say it has been difficult to attend trainings due to timing and other constraints. Teachers and leaders suggest that trainings would be more helpful if they were embedded in their school building, or a regional approach.

"I'd like PDs to be a smaller group so I could see my school hosting another school's staff or something like that, and they do the training together." – School Leader

We think regional PDs where we could pull the schools closer together and utilize that time. It'd be great." – School Leader

SEATTLE PUBLIC SCHOOLS

Implementation Findings

Finding 13: Teachers generally use enVision embedded assessments, though they frequently make adjustments to fit their classroom contexts.

In site visits, teachers say they both use and appreciate the embedded assessments in enVision

Adjustments or changes that teachers make include:

- **Re-wording the questions in the assessment** to make them more relevant for their class
- **Re-writing the questions to provide more space** for students to write
- **Pulling questions from the lesson quizzes or online assessments** because the summative assessments are too long or not a good fit for students

"I use the summative assessments that are in the curriculum and I do usually rewrite them. I don't like the fact that they have no space to show their work and I often take out the multiple choice as well." – Teacher

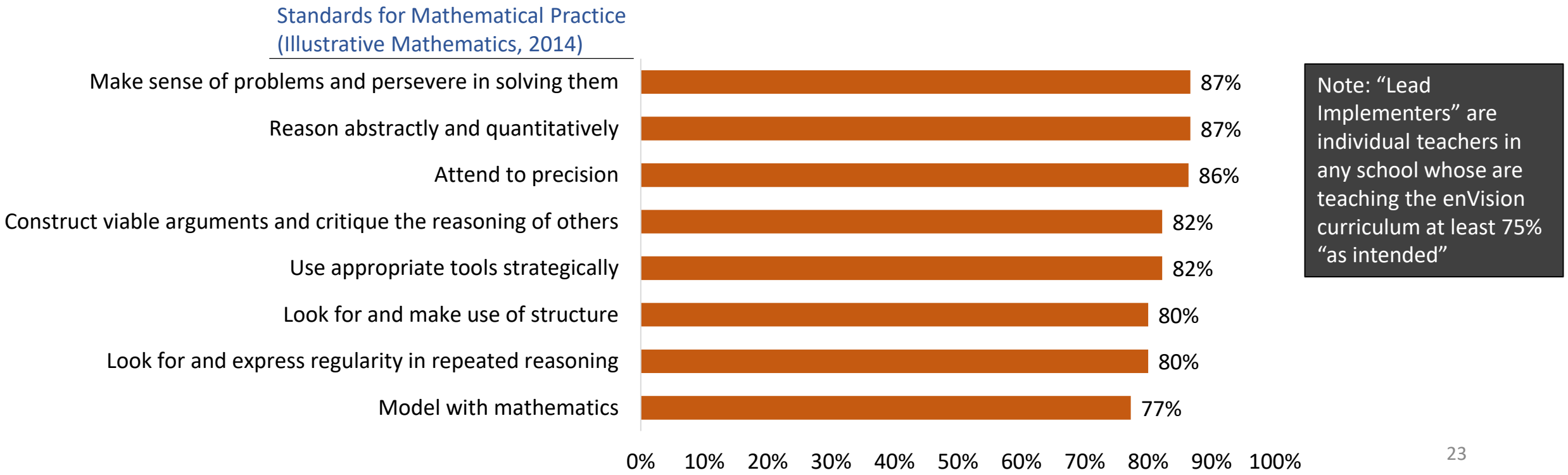
"The summative tests…are just too massive. They're either all multiple choice, which I don't like, or it's a performance assessment that's just inaccessible to some of the kids. So, now I just pull. Now I'm going to go back to the lesson quizzes that we didn't use and pull questions from those." – Teacher

SEATTLE PUBLIC SCHOOLS

Student Outcomes Findings

Finding 1: "Lead Implementer" teachers of enVision feel confident that their instructional practices prepare students for the WA State Standards for Mathematical Practice

Percentage of Lead Implementer teachers (n=46) who "Agreed" or "Strongly Agreed" to the statement: "I feel confident that my current instructional practices prepare my students to…

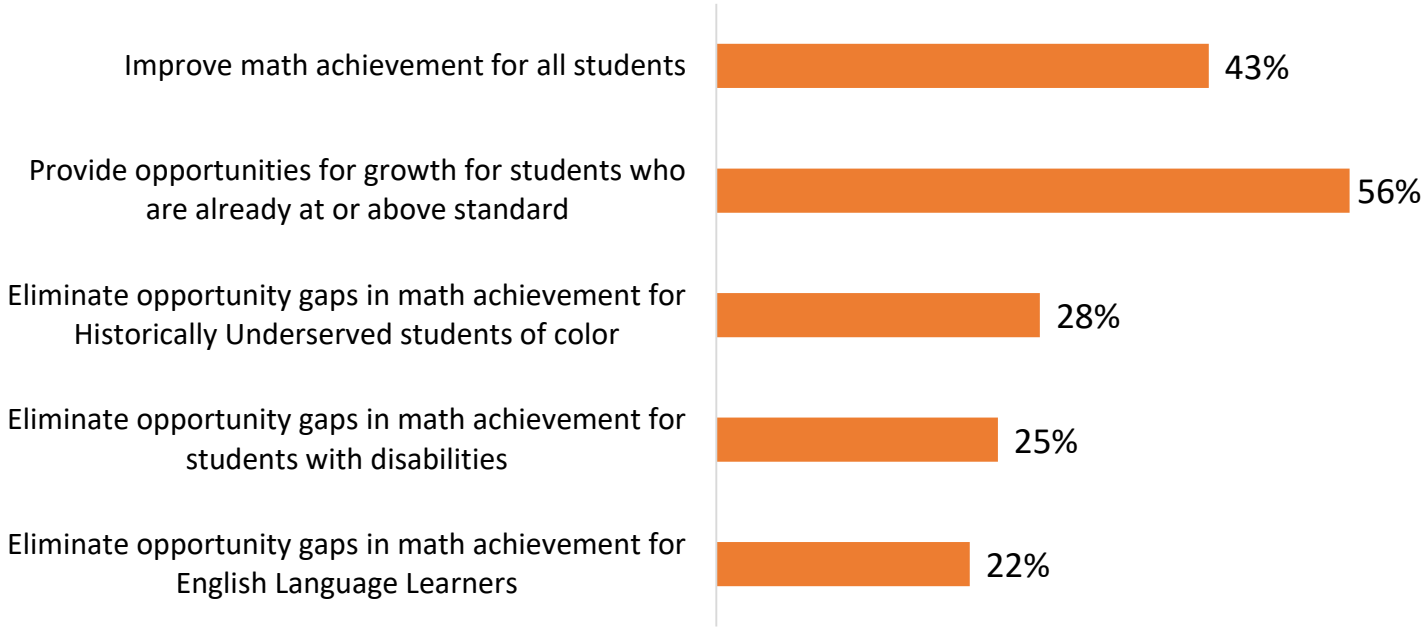


Note: "Lead Implementers" are individual teachers in any school whose are teaching the enVision curriculum at least 75% "as intended"

Student Outcomes Findings

Finding 2: Teachers are not confident that instructional materials alone will help to eliminate opportunity gaps for students of color, students with disabilities, and English Learners

Teacher Survey: Percentage of respondents (n=81) who "Agreed" or "Strongly Agreed" to the statement: "I believe that implementing enVision "as intended" will help to…



"I think we've taken the first step for sure as a district, but there are many more steps to take around equitable outcomes for students. I don't think just implementing a six, seven, eight coordinated curriculum is going to be the thing. It's just one step." – School Leader

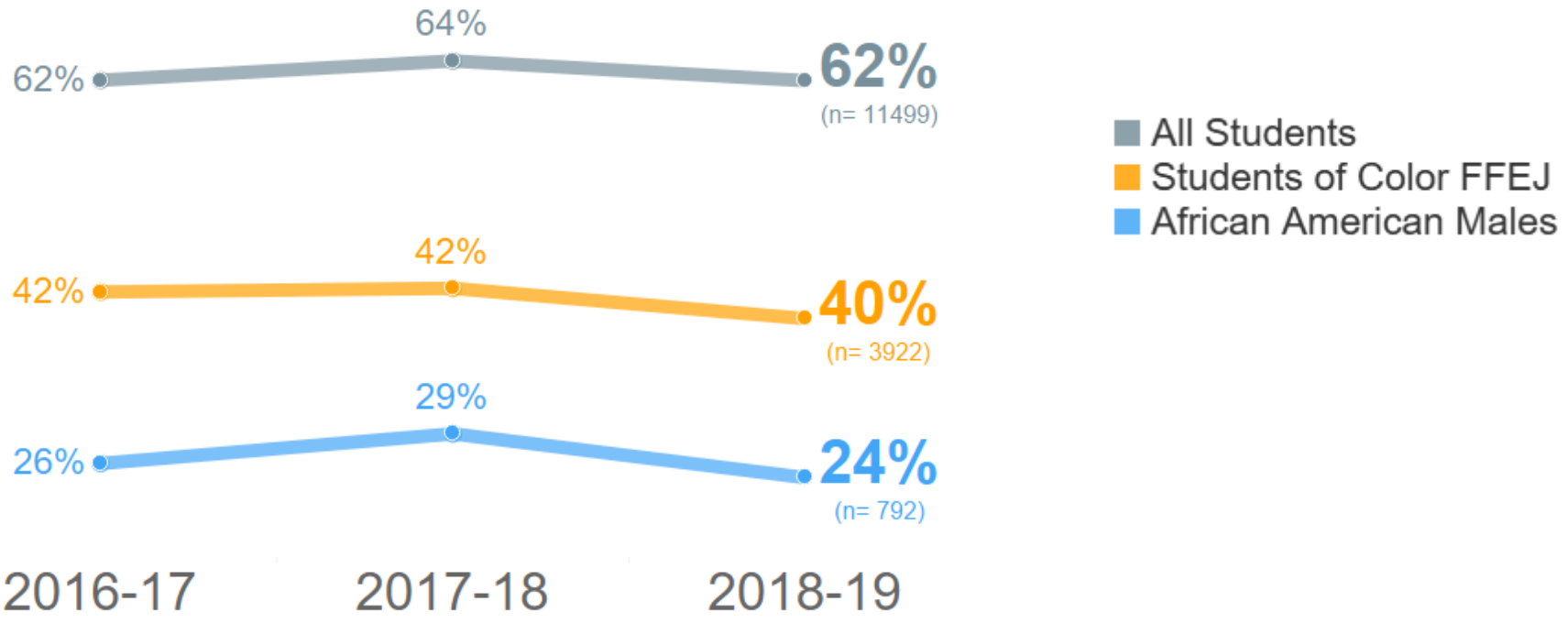
"What it's going to take to get to that Strategic Plan goal of seventh grade math? Well we're not going to do it if we continue to ignore ELL and special education."-- School Leader

"Some of our kids in ELL have the hardest time in those classes because it is so language driven, because it is conceptual, because you are making meaning. We've been really thinking about that, "How do we give them more time with definitions? How do work them in?" -- School Leader

Student Outcomes Findings

Finding 3: Smarter Balanced Assessment (SBA) data show that proficiency rates in Grades 6-8 dropped slightly this year. Currently about one in four African American male students is testing as proficient on the SBA in middle school.

Percent Meeting Standard on SBA, Grades 6-8 Combined



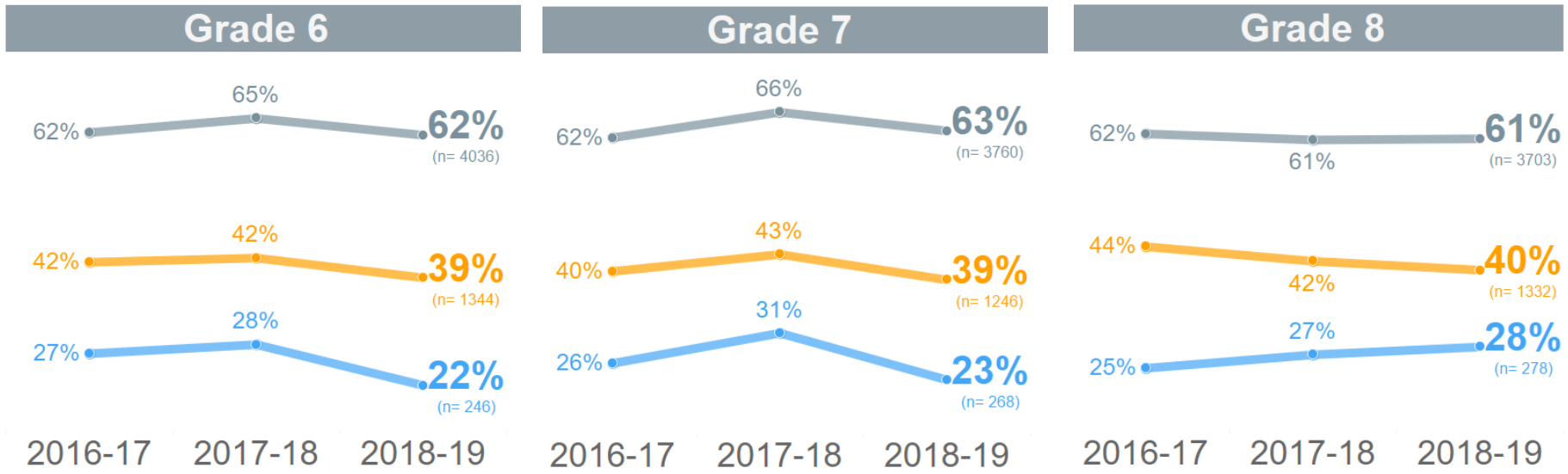
Students of Color FFEJ = Students of Color Furthest From Educational Justice:
African and African American, Latinx, Pacific Islander, Southeast Asian, and Native American Students

SEATTLE PUBLIC SCHOOLS

Student Outcomes Findings

Finding 4: SBA results disaggregated by grade level show proficiency declines in Grade 6 and Grade 7 (the Seattle Excellence focus area), but little change in Grade 8.

Percent Meeting Standard on SBAs by grade level



All Students
Students of Color FFEJ
African American Males

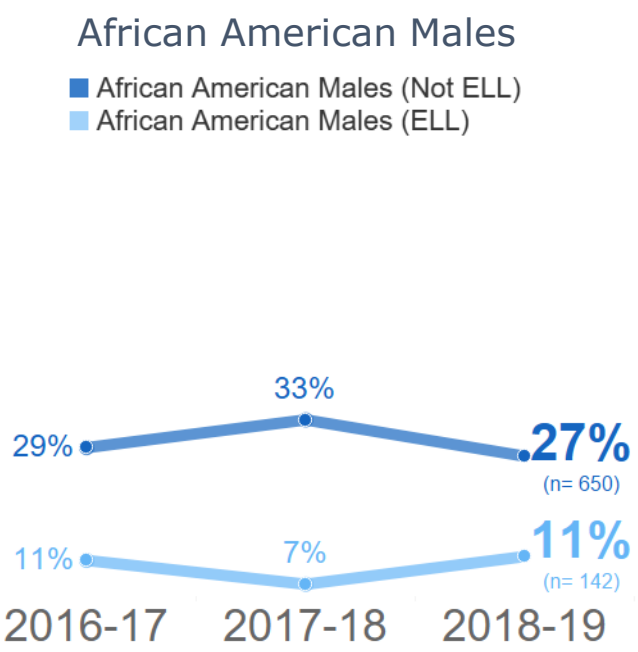
Students of Color FFEJ = Students of Color Furthest From Educational Justice:
African and African American, Latinx, Pacific Islander, Southeast Asian, and Native American Students

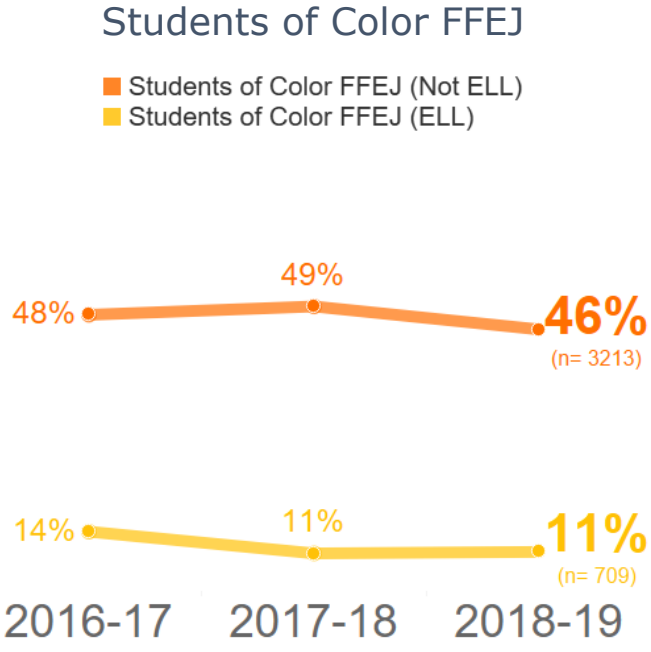
SEATTLE PUBLIC SCHOOLS

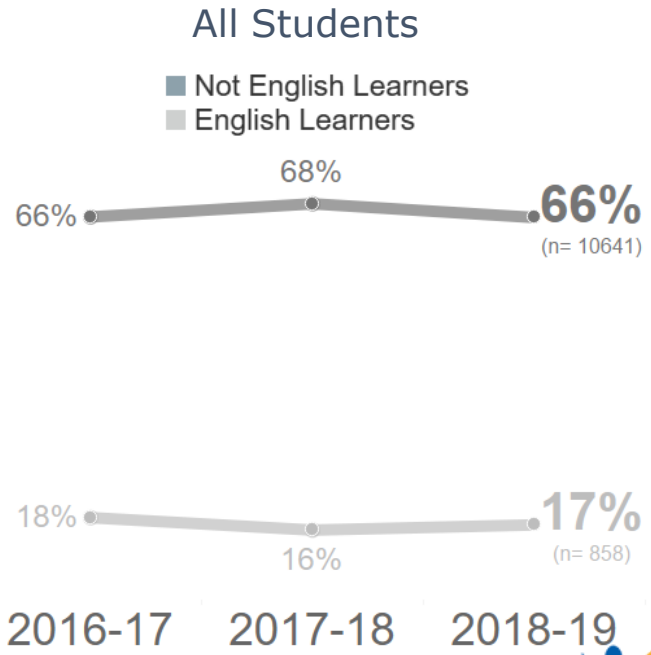
Student Outcomes Findings

Finding 5: Achievement results show large differences in SBA proficiency rates for students receiving English Language Learner (ELL) services versus those who do not receive those services.

Smarter Balanced Math (Percent Meeting Standard, Grades 6-8)







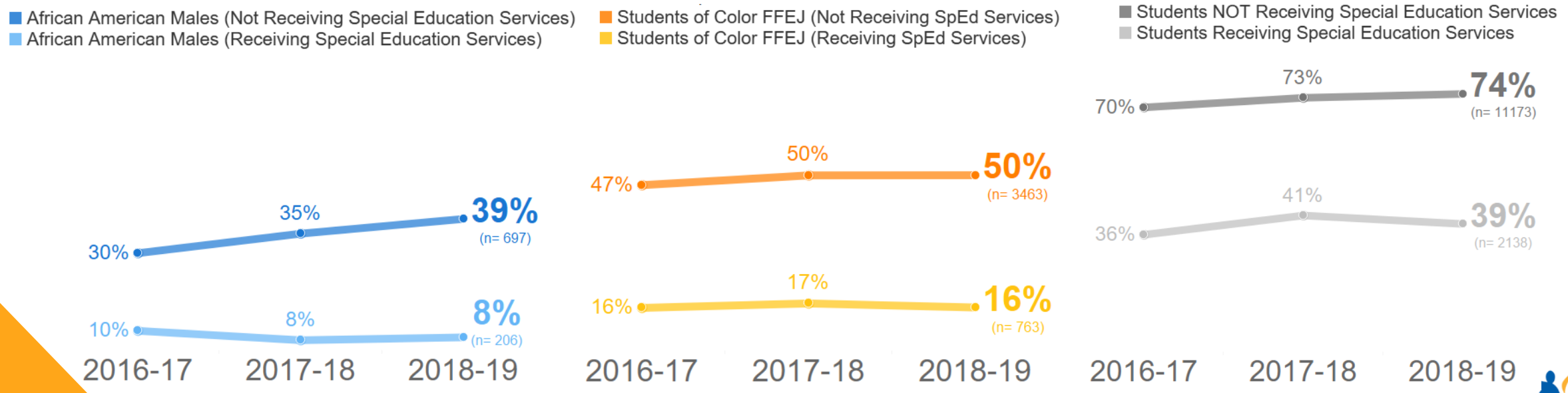
Students of Color FFEJ = Students of Color Furthest From Educational Justice:
African and African American, Latinx, Pacific Islander, Southeast Asian, and Native American Students

SEATTLE PUBLIC SCHOOLS

Student Outcomes Findings

Finding 6: Achievement results show large differences in SBA proficiency rates for students receiving special education (SpEd) services versus those who do not receive those services.

Smarter Balanced Math (Percent Meeting Standard, Grades 6-8)

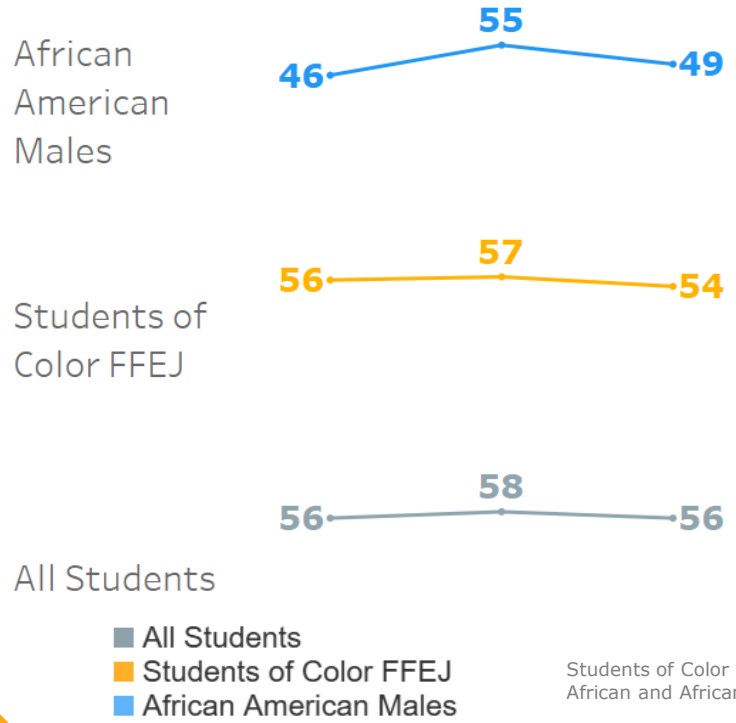


Students of Color FFEJ = Students of Color Furthest From Educational Justice:
African and African American, Latinx, Pacific Islander, Southeast Asian, and Native American Students

SEATTLE PUBLIC SCHOOLS

Student Outcomes Findings

Finding 7: When looking at student growth, we see relatively level growth from prior years for students of color furthest from educational justice, but a drop for African American males. Growth for African American male students this year is higher than less than half of academic peers statewide.



How to read Student Growth Percentiles Data

Student Growth Percentiles (SGPs) represent students' growth relative to the growth of other students who had similar scores in prior years.

To read the slide, one would say, "In Seattle Public Schools, the median African American male student showed growth that was higher than 46% of their academic peers throughout the state."

For more information on SGPs, visit the WA State website at https://www.k12.wa.us/data-reporting/reporting/student-growth-percentiles-sgp

Students of Color FFEJ = Students of Color Furthest From Educational Justice:
African and African American, Latinx, Pacific Islander, Southeast Asian, and Native American Students

Next Steps and District Actions

Research Finding: enVision materials are sometimes overly scaffolded, may not be sufficiently rigorous for all students.

District Response:

→ **2018-19: District staff made available enVision content without the publisher's scaffolding.** Teachers were provided up to three days of professional development on best practice in engaging students in the less-scaffolded problems.

→ **2019-20: District staff will provide additional opportunities for teachers to develop practices for engaging all students in rich problems with appropriate scaffolding.** Additional professional development planned. District staff will also make available options for online, environmentally friendly versions of appropriately scaffolded problems.

Next Steps and District Actions

Research Finding: Some teachers are having trouble pacing their instruction using enVision and would like help with practicing previously learned concepts.

District Response:

→**Convene teacher work-group in early Spring to focus on pacing and prior knowledge for each unit**, based on their experience the past two years.
(Timeline: Deliver documents to all teachers by June.)

→**Collect districtwide data on pacing progress.** District will collect information on 2020 Teacher Survey on teachers' current pace with the materials, and respond with school-targeted supports for effective pacing.

Next Steps and District Actions

Research Finding: Many teachers want additional guidance and professional development about building in high quality student discourse into their classrooms using enVision.

District Response:

→ **Summer 2019 professional development offered on select topics (groupwork strategies, using rich problems, etc.).**
(Possible extension in 2019-20, pending funding)

→ **Summer 2019 and school year 2019-20 professional development on engaging reluctant learners.**

→ **School year 2019-20 professional development on differentiation**

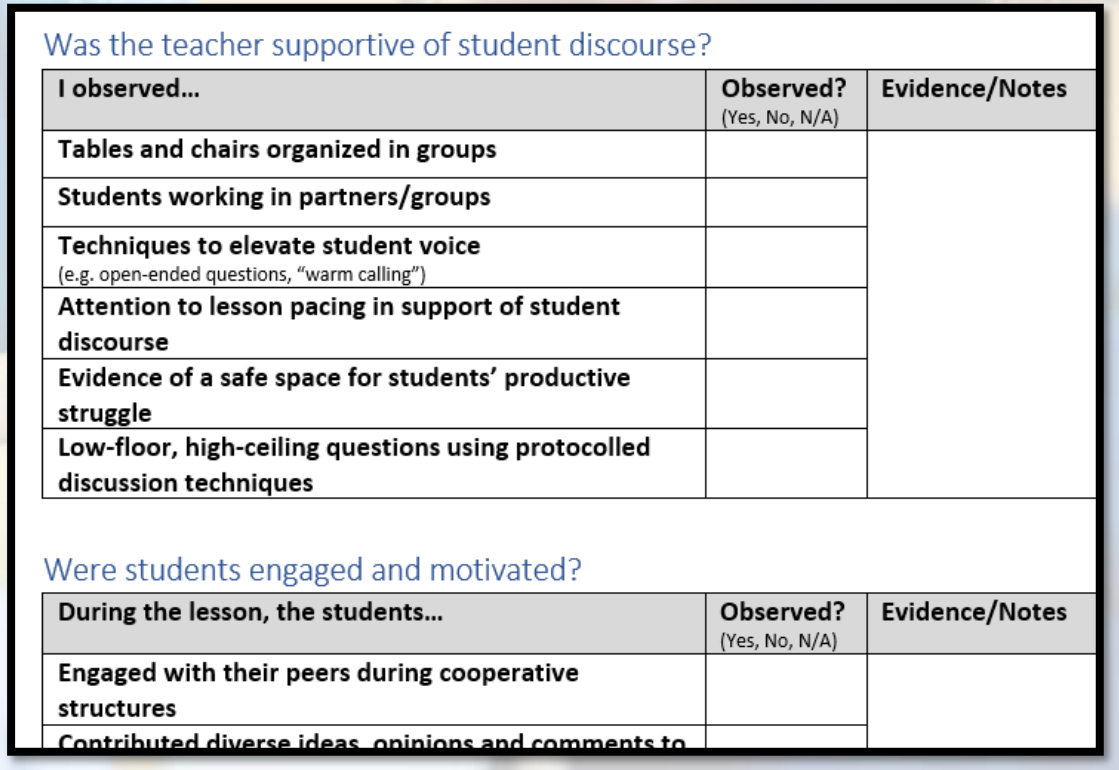
Next Steps and District Actions

Research Finding: Teachers want more opportunities to observe classroom instruction using enVision

District Response:

- Provide a **walk-through tool** to school leaders (October Leadership Learning Day) and teachers (TBD) to examine practices with materials implementation, student discourse, and student engagement

- **Continue to provide professional development** on "studio model" approach toward peer learning



Was the teacher supportive of student discourse?

I observed…	Observed? (Yes, No, N/A)	Evidence/Notes
Tables and chairs organized in groups		
Students working in partners/groups		
Techniques to elevate student voice (e.g. open-ended questions, "warm calling")		
Attention to lesson pacing in support of student discourse		
Evidence of a safe space for students' productive struggle		
Low-floor, high-ceiling questions using protocolled discussion techniques		

Were students engaged and motivated?

During the lesson, the students…	Observed? (Yes, No, N/A)	Evidence/Notes
Engaged with their peers during cooperative structures		
Contributed diverse ideas, opinions and comments to		

Next Steps and District Actions

Research Finding: Despite investments in instructional materials aligned to standards, students of color furthest from education justice, and African American males in particular, have low math proficiency in both 5th and 7th grade.

District Response:

Seattle Excellence plan focuses on 5th and 7th grade math proficiency for students of color furthest from educational justice and African American males.

For questions or more information about this study, please email:
research@seattleschools.org

More information about the SPS Research & Evaluation Department can be found at:
https://www.seattleschools.org/departments/rea