

MEMORANDUM

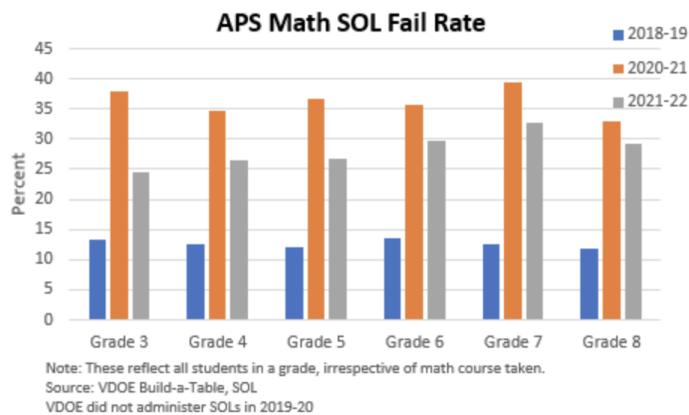
TO: Arlington School Board  
 FROM: Mathematics Advisory Committee  
 DATE: March 15, 2023  
 SUBJECT: Recommendations to Help Our Struggling Math Students

COMMITTEE CHAIR: Rachel Whirley  
 COMMITTEE MEMBERS: Marian Klymkowsky, Todd Truitt, Emily Cunningham, Reginald Goeke, Mike Steenhoek, Yun Kang, Greg Eastman  
 STAFF LIAISONS: Shannan Ellis, Carl Seward

**INTRODUCTION**

APS students’ math proficiency dropped sharply during COVID’s wake. In the aftermath, teachers, students, and parents have had to adjust strategies to combat learning loss and move forward. Because of the disparate impact of distance learning and reduced class times, students have still not fully recovered. The share of students failing their mathematics Standards of Learning (SOLs) surged in the 2020-2021 school year, and despite movement in the right direction, failure rates remain abnormally high (see Figure 1). Additionally, learning deficits are sharpest among more vulnerable students, including English language learners, special education students, and low-income minority students. Learning loss in mathematics is particularly damaging because math courses build on the lessons taught in previous years. As these students move through school years, they will continue to be behind unless they receive proper intervention.

*Early numeracy is the strongest predictor of student outcomes.*



**Figure 1: APS Math SOL Fail Rates Graph**

Critically, early numeracy is the strongest predictor of student outcomes. Students who are unable to understand and process mathematics should be just as concerning as students who are unable to read. Numeracy is critical to everyday life, and APS must begin to treat it as such.

Elementary and middle school students scoring “Below Basic” (as well as many elementary students scoring “Basic”) on

Math Inventory<sup>1</sup> again fell short on a full year's growth last school year. This result worsens their cumulative learning deficit, widening the achievement gap. To APS' credit, all students that scored "Proficient" and above on their Math Inventory made more than a year's worth of growth in the last school year.

---

*Over 3,500 Arlington students need Tier III intervention. Arlington currently has six interventionists providing that support to about 200 of those students, none of which are funded through the APS budget.*

---

Like most school districts, APS relies heavily on its Tier 1, or core classroom, instruction for most students to both remedy learning loss and advance new learning. With an ever-widening gap between proficient and struggling students, it is becoming increasingly difficult for one classroom teacher to accommodate the learning needs of all students within their classrooms. APS does use Tier 2 instruction, which provides students with tailored instruction in a small group setting—provided by teachers, Interventionists, Coaches<sup>2</sup>, or classroom aides, depending

on availability—and Tier 3 instruction, which provides both tailored, research-based small group instruction as well as additional time with Mathematics Interventionists currently funded through the ESSER-III Grant. However, the demand for such resources far exceeds current staffing availability (see Appendix A for current Mathematics Coach and Interventionist allocations). ***As of March 2023, 3,547 students in Kindergarten through 8<sup>th</sup> grade are at a "Below Basic" level; all of them need Tier III intervention. County-wide, we only have six interventionists to split between them.***

In addition to these much needed staff resources, core instruction is critical for all APS students to continue to grow in mathematics. Currently, teachers of mathematics in Arlington are not required to engage in any professional development with the Mathematics Office. While the state of Virginia requires that teachers complete a certain number of required professional development hours, they do not require it be in the subject that teachers actually teach. The Mathematics Office provides highly rated professional development opportunities for teachers, helping them to learn new, research-based approaches to instruction, as well as assisting them on the latest resources available to them. However, only those teachers who choose to attend these courses are able to benefit from the Mathematics Office's hard work.

As such, we recommend APS expand its current approach as follows: ***APS must provide the necessary resources to reach those most in need through the fulfillment of Mathematics Coach and Interventionist FTEs and improve core classroom instruction for all students by requiring teachers of mathematics to engage with the Mathematics Office's Professional Development opportunities.***

---

<sup>1</sup> The State of Virginia administers Standards of Learning (SOL) tests at the end of each year to measure student proficiency. Math Inventory (MI) is a classroom-based, universal screener and monitoring tool.

<sup>2</sup> Math Coaches strengthen core instruction by being a resource for teachers on the latest research-based instructional practices. They can additionally provide in-classroom assistance to teachers.

Mathematics Interventionists provide research-based interventions directly to students in small groups or one-on-one sessions, with interventions tailored to those individual students' needs.

**RECOMMENDATION #1: Hire 34 Math Interventionists to be distributed across all grade levels and provide 8.5 additional FTE to allow for a full-time Mathematics Coach at every elementary school and the ACC/Arlington-Tech and HB Woodlawn Programs.**

**Rationale for Recommendation:**

---

*The current APS budget does not allocate for any Mathematics Interventionists at any grade level.*

---

This past year, as part of the ESSER-III Grant, Arlington received funding for 6 Mathematics Interventionists through SY2023-24. While welcome, this staffing pales in comparison to the current need and expires at the end of the 2023-24 school year. With those funds sunsetting in 2024, APS needs to plan to meet the need for interventionists within its budget. Presently, there are over 3,500 students in grades K-8 in Arlington scoring “Below Basic”. Without these additional resources, these already struggling students will continue facing learning deficits and a

widening learning gap. The current APS budget does not allocate for any Mathematics Interventionists at any grade level. **Last year, the Mathematics Office identified a need for 34 Mathematics Interventionists to remediate learning loss. MAC urges APS to fund this request in earnest and address the growing learning gap affecting the county’s most in-need students.**

Mathematics and English Language Arts (ELA) are vital, core parts of student learning. APS has rightfully provided generous resources to ELA, where all 25 elementary schools have a 1.5 FTE Reading Coach allocated. In contrast, there is a far smaller allocation for math: only **one** elementary school has a 1.5 FTE Mathematics Coach; nine schools have 1.0 FTE, and 15 schools have a mere 0.5 FTE (see Appendix B). **MAC implores APS to move mathematics toward parity with ELA by bringing all elementary schools and the ACC/Arlington-Tech and HB Woodlawn Programs up to at least a 1.0 FTE Mathematics Coach, requiring 8.5 new FTEs total.**

These new positions will provide critical support to elementary teachers as they become familiar with new textbook and resource adoptions, strive to fill gaps and advance student learning in very heterogeneous classrooms, all while providing a critical link between classroom teachers and interventionists as they seek to maximize learning for every student.

**Budgetary Implications:**

This request will require 34 FTE for Mathematics Interventionists and 8.5 FTE for Mathematics Coaches, totaling 42.5 FTE. Please see Appendix C for a full breakdown of the staffing need and cost.

While this is a large request, it is imperative that APS act now in providing these critical support positions to students and teachers. Innumeracy is just as critical an issue as illiteracy; APS has done well to combat the latter, and we urge APS to meet the minimum needs as outlined here to combat the former.

**Strategic Plan Alignment:**

- S-SS-2: Deliver curriculum through innovative and relevant instruction that is differentiated to meet the diverse needs of each student.
- S-EW-1: Recruit, retain, and advance high-quality employees.
- S-OE-1: Manage available resources equitably.
- S-OE-2: Provide high-performance learning and working environments that support Universal Design for Learning standards.
- S-OE-4: Use long-term and systematic processes to ensure academics and operations are financially sustainable.
- S-P-1: Provide training and resources for staff and families to create meaningful partnerships that support student success and well-being.

**Committee Vote: 8/8 Approve**

**RECOMMENDATION #2: Require mathematics professional learning as part of the mandatory professional development required for teachers of mathematics.**

**Rationale for Recommendation:**

Currently, Arlington mathematics teachers are not required to engage with the Mathematics Office in professional learning. In APS, all teachers are required to take 180 hours of professional learning every five years, however no teachers, including those who teach mathematics for part of their classes (like elementary teachers) or those who are fully devoted to mathematics, are required to take any mathematics professional development. While some teachers voluntarily participate in professional learning opportunities provided by the Mathematics Office, it is done at their own initiative. Making mathematics professional learning a requirement as part of their paid hours to take such courses would allow for our teachers to better develop their mathematics teaching skills, increase engagement between the teachers and the Math Office, and provide our students with teachers who are up to date on the best strategies for teaching mathematics in the classroom.

Reaching students through their core classroom instruction is the most efficient and effective way to positively impact student outcomes. In order to do so, their teachers must be up to date on the latest research-based education methods, adjusting their classes as needed to address modern challenges. The Mathematics Office takes great care to create professional learning courses based upon the latest evidence-based research on what teaching strategies work best for various types of students. With the impact of the pandemic still very profound, their courses have adapted to help teachers reach students where they are and help them get to where they need to be. However, many teachers of mathematics are not learning these new techniques because they are not attending any professional development courses related to Mathematics. In order to ensure that all students receive the best instruction

possible, MAC urges APS to require teachers of mathematics to engage in the Mathematics Office's professional learning opportunities.

**Budgetary Implications:**

Because we are not recommending adding any additional hours to the teachers' professional development, there is no added budget requirement to implement this recommendation.

The Mathematics Office understands that requiring teachers to engage with them as part of their professional learning requirements would necessitate them tracking which teachers have attended relevant courses and which would still need to do so. They will gladly take on this additional work, and indeed should this recommendation go in effect, they plan to work with individual teachers to determine which courses will be the best fit for them based on where they are in their careers.

**Strategic Plan Alignment:**

- S-SS-2: Deliver curriculum through innovative and relevant instruction that is differentiated to meet the diverse needs of each student.
- S-EW-1: Recruit, retain, and advance high-quality employees.
- S-EW-2: Provide growth opportunities by implementing a competency-based professional learning and evaluation framework inclusive of all staff members.
- S-EW-3: Grow and develop current and future high-quality leader/managers.

**Committee Vote: 8/8 Approve**

**FUTURE RECOMMENDATIONS UNDER DISCUSSION**

As long as APS continues to not fully provide the necessary staffing allocations to support our mathematics students and teachers, MAC will continue to urge you to fill that need.

**APPENDIX A**

**Math Coach and Interventionist Allocations, SY2022-23**

<b>LEGEND</b>		
At least 1.0 FTE	Between 0.0 and 1.0 FTE	No Funding

ELEMENTARY SCHOOL	Budget Allocation for Math Coaches	Math Coach Staffing (with Principal reallocation)	Budget Allocation for Math Interventionists	Math Interventionist Staffing (ESSER Funding expiring 2024-2025)
ABINGDON *	1.0	2.0	0	1.0
ARL. SCIENCE FOCUS	0.5	1.0	0	0
ARL. TRADITIONAL**	1.0	1.0	0	0
ASHLAWN	0.5	0.5	0	0
BARCROFT *	1.0	2.0	0	0.5
BARRETT *	1.0	2.0	0	0.5
CAMPBELL *	1.0	1.0	0	0
CARDINAL**	1.0	1.0	0	0
CARLIN SPRINGS*	1.0	2.0	0	1.0
CLAREMONT	0.5	1.0	0	0
DISCOVERY	0.5	1.0	0	0
DR CHARLES DREW*	1.0	1.0	0	0.5
ESCUELA KEY	0.5	1.0	0	0
FLEET	0.5	1.0	0	0
GLEBE	0.5	0.5	0	0
HOFFMAN-BOSTON*	1.5	1.5	0	0.5
INNOVATION	0.5	1.0	0	0
JAMESTOWN	0.5	1.0	0	0
LONG BRANCH	0.5	1.5	0	0
MONTESSORI PSA	0.5	0.5	0	0
NOTTINGHAM	0.5	1.0	0	0
OAKRIDGE	0.5	1.0	0	0
RANDOLPH*	1.0	1.0	0	0.5
TAYLOR	0.5	0.5	0	0
TUCKAHOE	0.5	1.0	0	0

2022-2023 Mathematics Advisory Committee Report and Recommendations

\* **Indicates a Title I School.** The Title I program provides financial assistance through state educational agencies to local educational agencies and public schools with high numbers or percentages of poor children to help ensure that all children meet challenging state academic content and student academic achievement standards.

\*\* **Indicates school with a projected enrollment exceeding 650 students.**

*All Title I Schools and Schools with expected enrollments exceeding 650 students were allocated a 1.0 FTE Math Coach for 2022-2023. This added the equivalent of 5 Full-Time Math Coaches at the elementary level.*

MIDDLE SCHOOL	Budget Allocation for Math Coaches	Staffing (with Principal reallocation)	Budget Allocation for Math Interventionists	Math Interventionist Staffing (ESSER Funding)
HAMM	1.0	1.0	0	0
GUNSTON	1.0	1.0	0	0.5
JEFFERSON	1.0	1.0	0	0.5
KENMORE	1.0	1.0	0	0.5
SWANSON	1.0	1.0	0	0
WILLIAMSBURG	1.0	1.0	0	0
HIGH SCHOOL	Budget Allocation for Math Coaches	Staffing (with Principal reallocation)	Budget Allocation for Math Interventionists	Math Interventionist Staffing (ESSER Funding)
WAKEFIELD	1.0	1.0	0	0
W-L	1.0	1.0	0	0
YORKTOWN	1.0	1.0	0	0
PROGRAMS	Budget Allocation for Math Coaches	Current Staffing (with Principal reallocation)	Budget Allocation for Math Interventionists	Math Interventionist Staffing (ESSER Funding)
ACC/ARLINGTON TECH	0.5	0.5	0	0
HB-WOODLAWN	0.5	0.5	0	0

*Staffing Allocations for High School Math Coaches are new in 2022-2023.*

*While principals are able to reallocate funding for Mathematics Coaches, this is done on a yearly basis and is not consistent. This adds an additional challenge of hiring a Mathematics Coach who they may not be able to hire the following year.*

**APPENDIX B**

**Current APS Budget-Funded Elementary School Allocations by Type, SY2022-23**

<b>LEGEND</b>				
More than 1.0 FTE			1.0 FTE	Between 0.0 and 1.0 FTE
<b>ELEMENTARY SCHOOL</b>	<b>Reading Specialist and Interventionist</b>	<b>Resource Teacher for the Gifted (RTG)</b>	<b>Instructional Technology Coordinator (ITC)</b>	<b>Math Coach and Interventionist*</b>
ABINGDON	2	1	1	1
ARL. SCIENCE FOCUS	1.5	1	1	0.5
ARL. TRADITIONAL	1.5	1	1	0.5
ASHLAWN	1.5	1	1	0.5
BARCROFT	2	1	1	1
BARRETT	2.5	1	1	1
CAMPBELL	1.5	1	1	1
CARDINAL	2	1	1	1
CARLIN SPRINGS	2.5	1	1	1
CLAREMONT	1.5	1	1	0.5
DISCOVERY	1.5	1	1	0.5
DR CHARLES DREW	2	1	1	1
ESCUELA KEY	1.5	1	1	0.5
FLEET	1.5	1	1	0.5
GLEBE	1.5	1	1	0.5
HOFFMAN-BOSTON	2	1	1	1.5
INNOVATION	1.5	1	1	0.5
JAMESTOWN	1.5	1	1	0.5
LONG BRANCH	1	1	1	0.5
MONTESSORI PSA	1.5	1	1	0.5
NOTTINGHAM	1	1	1	0.5
OAKRIDGE	1.5	1	1	0.5
RANDOLPH	2	1	1	1
TAYLOR	1.5	1	1	0.5
TUCKAHOE	1	1	1	0.5
<b>TOTAL</b>	<b>41</b>	<b>25</b>	<b>25</b>	<b>17.5</b>

*\*There is currently no Mathematics Interventionist funding in the APS Budget. We have added the language of interventionist here for a more accurate description of the comparison between ELA and Mathematics.*



## APPENDIX C

### School Breakdown for Requested Mathematics Coach and Interventionist FTEs

Estimated Cost per Mathematics Coaches (salary + benefits): \$104,705.88

Estimated Cost per Mathematics Interventionist (salary + benefits): \$105,000

Estimated Cost of Entire Request for Mathematics Coaches:

$$\begin{array}{r} 104,705.88 \\ \times 8.5 \\ \hline \$889,999.98 \end{array}$$

Estimated Cost of Entire Request for Mathematics Interventionists:

$$\begin{array}{r} 105,000.00 \\ \times 34 \\ \hline \$3,570,000.00 \end{array}$$

Total Cost for Mathematics Coaches and Interventionists:

$$\begin{array}{r} 889,999.98 \\ + 3,570,000.00 \\ \hline \$4,459,999.98 \end{array}$$