MEMORANDUM

TO: Arlington School Board

FROM: Mathematics Advisory Committee

DATE: DRAFT - November 29, 2022

SUBJECT: Draft Report and Recommendations

COMMITTEE CHAIR: Rachel Whirley

COMMITTEE MEMBERS:

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 students move through school years, they will continue to fall behind.

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

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.

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

To its credit, APS has made progress this year in closing learning gaps for students scoring Proficient and above on Math Inventory. In addition, all students scoring Basic and above on their SOLs are making more than a year’s worth of growth in a year. However, elementary and middle school students scoring Below Basic again fell short on a full year’s growth last year. This result worsens their cumulative learning deficit, widening the achievement gap.

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. While APS actively uses Tier 2 instruction, which provides students with tailored instruction in a small group setting, and Tier 3 instruction, which provides both tailored, small group instruction as well as additional time with Mathematics Interventionists funded through the ESSER-III Grant, the demand far for such resources exceeds current staffing availability (see Appendix A for current Mathematics Coach and Interventionist allocations). In addition, 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.

In addition to these much needed 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.***

**RECOMMENDATION #1: Hire 34 Math Interventionists to be distributed across all grade levels and provide 7.5 additional FTE to allow for a full-time Mathematics Coach at every elementary school.**

**Rationale for Recommendation:**

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 2,271 students in grades K-8 in Arlington scoring “Below Basic” on Math Inventory. 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 gradelevel**.**  **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.**

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

Mathematics and English Language Arts (ELA) are vital, core parts of student learning. APS has rightfully provided generous resources to ELA, where every elementary school has 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 up to at least a 1.0 FTE Mathematics Coach, requiring 7.5 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 7.5 FTE for Mathematics Coaches, totaling 41.5 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:**

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

**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:**

**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**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **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 |

\* **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 | 0 | 0 | 0 |
| **W-L** | 1.0 | 0 | 0 | 0 |
| **YORKTOWN** | 1.0 | 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 | 0 | 0 |
| **HB-WOODLAWN** | 0.5 | 0 | 0 | 0 |

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

**APPENDIX B**

**Current Elementary School Allocations by Type, SY2022-23**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **ELEMENTARY SCHOOL** | **Reading Specialist and Interventionist**  | **Resource Teacher for the Gifted (RTG)** | **Instructional Technology Coordinator (ITC)** | **Math Coach and Interventionist** |
| **Abingdon** | 2 | 1 | 1 | 1 |
| **ASFS** | 1.5 | 1 | 1 | 0.5 |
| **Ashlawn** | 1.5 | 1 | 1 | 0.5 |
| **ATS** | 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 |
| **Drew** | 2 | 1 | 1 | 1 |
| **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 |
| **Key** | 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 |
| **TOTAL** | 41 | 25 | 25 | 12.5 |

**APPENDIX C**

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

Please note: this appendix is forthcoming and will be included in the final version of this report.