Chesapeake Bay Watershed 2024 Environmental Literacy Report

Virginia

Results from the ELIT Survey

Final Report: 4/4/2025

J. Sickler CONSULTING

PREPARED BY

Jessica Sickler & Rob Kloos

J. Sickler Consulting

PREPARED FOR

Chesapeake Bay Program Education Workgroup

Table of Contents

03 Background & Methods

09 Results: LEA Preparedness

15 Results: Student Participation in MWEEs

25 Results: EE Support Needs

BACKGROUND

Study Purpose & Methods

ELIT Background & Purpose

The Chesapeake Bay Environmental Literacy Indicator Tool (ELIT) was developed to monitor the capacity and progress of public school districts toward meeting the environmental literacy goal stated in the 2014 Chesapeake Bay Watershed Agreement. The goal was to:

> **Enable every student in the region to graduate with the knowledge and skills to act responsibly to protect and restore their local watershed.**

Three outcomes are stated in the agreement:

1. **Students**: Increase age-appropriate understanding of the watershed through meaningful watershed educational experiences (MWEEs) and rigorous, inquiry-based instruction, with a target of at least one MWEE in elementary, middle, and high school, depending on available resources.

2. **Sustainable Schools**: Increase the number of schools that reduce impact of buildings and grounds on their local watershed, environment, and human health through best practices, including student-led protection and restoration projects.

3. **Environmental Literacy Planning**: Develop a comprehensive and systemic approach to environmental literacy for all students, including policies, practices and voluntary metrics that support environmental literacy goals and outcomes.

The ELIT contributes to monitoring public school districts' progress toward these outcomes, collecting data about:

- School district preparedness to implement a comprehensive and systemic approach to environmental literacy education (Outcome 3);
- Student participation in MWEEs during the school year (Outcome 1);
- School district needs to support further improvements in environmental literacy education.

The ELIT tool used in 2024 was identical to the tool used in 2022.

The ELIT is administered biennially to all local education agencies (LEAs) in six jurisdictions in the Chesapeake Bay Watershed. **This report presents results from all responding LEAs in Virginia, regardless of whether they are in or out of the watershed.**

ELIT Data Collection

Data Collection Procedure

The ELIT is administered every two years as an electronic survey. It is intended to be completed by a single representative from the administration of each LEA (school district) who is able to report on district-wide activities. Additional data that are more reliably obtained through non-survey means (e.g., student enrollment) are identified from external sources and merged with the survey responses.

Past ELIT data were collected in 2015, 2017, 2019, and 2022. There was a one-year pause in data collection during the COVID-19 pandemic.

The Chesapeake Bay Program Education Workgroup organized data collection in 2024. Representatives from each state's education office led distribution of the survey to LEAs within their jurisdiction. ELIT data collection targets only public school districts. This report does not contain data about private or charter schools.

Data Collection Timing & Details

The 2024 ELIT asked districts to report on the status of activities for the 2023-24 school year. The ELIT survey opened for responses in August 2024 and remained open for responses through early December 2024.

This analysis and report present results from across the entire jurisdiction, which includes LEAs both inside and outside of the watershed.

Additional Information about Data

The most significant challenge of the ELIT is obtaining a strong response rate from 680 LEAs across six jurisdictions. As more LEAs report their activities into this dataset, the Chesapeake Bay Program has a more accurate understanding of the status of environmental literacy regionwide.

To maximize ability to generalize about conditions across the region, ELIT results include all data submitted in the current year's survey, as well as available data from prior ELIT surveys, within two years. **In this report, results include all responses to the 2024 ELIT, as well as data from any LEA that responded in 2022, but did not update their records in 2024.** The underlying assumption is that changes for non-reporting districts are likely minor in just two years.

In some analyses, we constrain the dataset to only those districts who provided data in *both* recent years – 2024 and 2022 – to offer the most accurate reporting of patterns of change at the district level.

About Rounding: In tables and graphs throughout this report, we display distributions with whole number percentages. In some tables and graphs, percentages may appear to add up to slightly more or less than 100%. This is due to variation when rounding decimals.

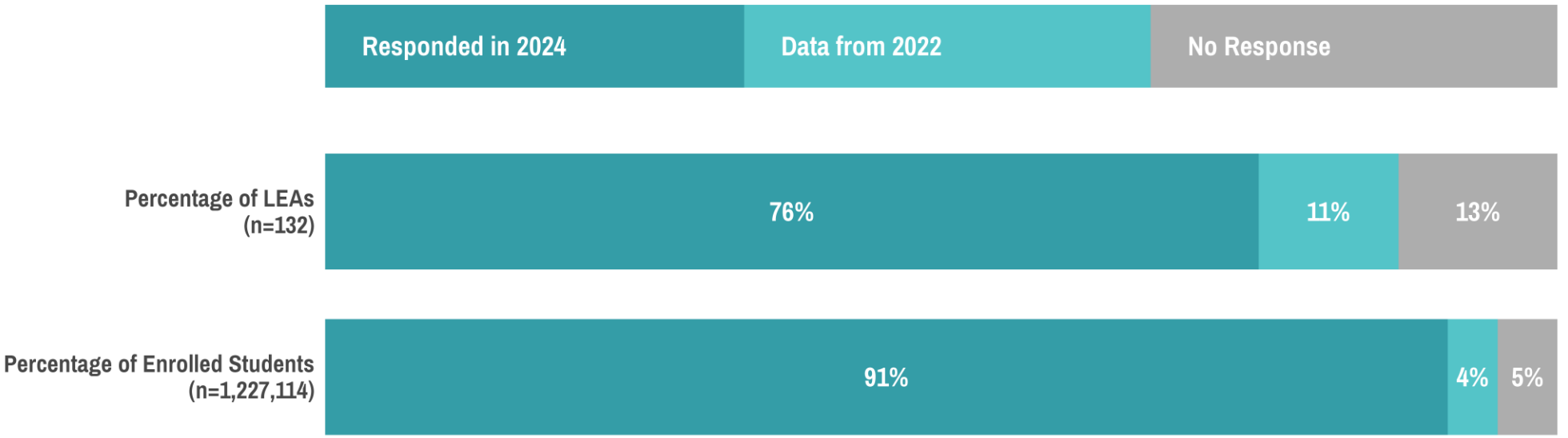
2024 ELIT Response Rate

100 out of 132 LEAs in Virginia completed the ELIT survey in 2024. This constituted a response rate of 76% of all districts, and it represented 91% of enrolled students in the state.

In addition to these new responses, Virginia had 2022 data from 15 LEAs, which was carried forward and included in analysis for the 2024 ELIT result. With these recent (but not updated) data included, the 2024 ELIT results for Virginia represent 87% of all LEAs and over 95% of all enrolled students.

Each year, Virginia has successfully increased the number of LEAs responding to the ELIT, with the 2024 marking the highest response rate of any year. With the inclusion of the 2022 data to supplement the updated 2024 data, the analysis in this report should provide a clear and up-to-date picture of the status of environmental literacy efforts in school districts statewide.

ELIT Response Rate: Percentage of all LEAs and of Enrolled Students across Virginia in 2024



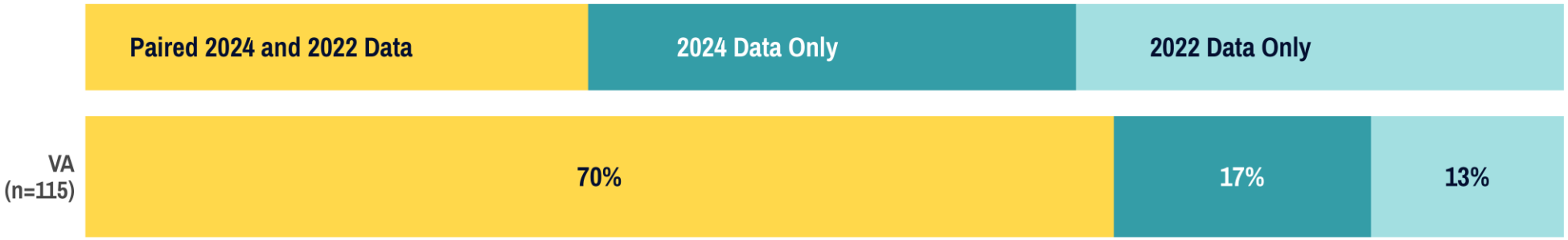
Availability of Paired Year-to-Year Data

A majority of data from LEAs in Virginia included paired responses from both the 2022 and 2024 ELIT surveys. This means that comparisons of year-to-year changes are likely a reasonably accurate representation of shifts that occurred in the state.

In the analyses that follow, we use this paired dataset to explore the degree to which changes have occurred between the last two years of ELIT surveys. By isolating comparisons to districts that responded in both current and previous years, we can eliminate "noise" in the data that may be due to changes in which districts responded (or not) in a given year. While a smaller dataset, these analyses allow the jurisdiction to see the actual movement of a given district between years.

Repeat ELIT Respondents: Availability of Paired 2024 and 2022 Data

The dataset used for the 2024 analysis includes data from 115 LEAs. The yellow segments show the proportion of districts for which we have paired data from both 2024 and 2022 ELIT collection. The remaining segments (teal) indicate districts for which we only have one year's data (either 2024 or carried-forward data from 2022).



Staff Responsible for Sustainable Schools

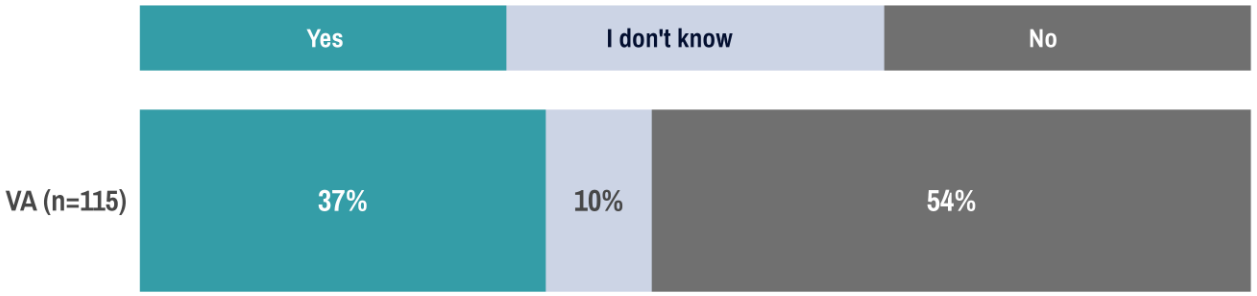
Slightly more than a quarter of the responding LEAs indicated that their district has dedicated staff responsible for sustainable schools.

The 2024 ELIT did not engage in a full inquiry of sustainable schools practices, to reduce the burden on districts where data may be gathered elsewhere. Only one question was asked, which was to gauge if the district had dedicated staff responsible for sustainable school efforts.

Virginia reported a modest rate of this staffing level, with 37% (or 42 out of 115) of LEAs having dedicated staff responsible for coordinating sustainable school efforts.

Sustainable Schools: Presence of Support Staff

Responses to the question: Does your LEA have a staff lead or team responsible for coordinating sustainable schools efforts?



RESULTS

Preparedness to Implement Environmental Education

Measurement Overview

To assess each LEA's current capacity to implement a comprehensive and systemic approach to environmental education (EE), respondents considered six elements (below) and indicated for each whether it was:

- Not in place
- Partially in place
- Fully in place

The response for each element was scored with a value of 0, 1, or 2, respectively. These values were summed to arrive at a total preparedness score for the district.

Six Elements Used to Determine LEA Preparedness for EE:

a) An established program leader for environmental education (providing effective, sustained, and system leadership).

b) An integrated program infusing environmental concepts into appropriate curricular areas.

c) Regular communication among staff responsible for environmental education curriculum and program implementation.

d) A support system in place that enables teachers and administrators to engage in high quality professional development in content knowledge, instructional materials, and methodology related to environmental education.

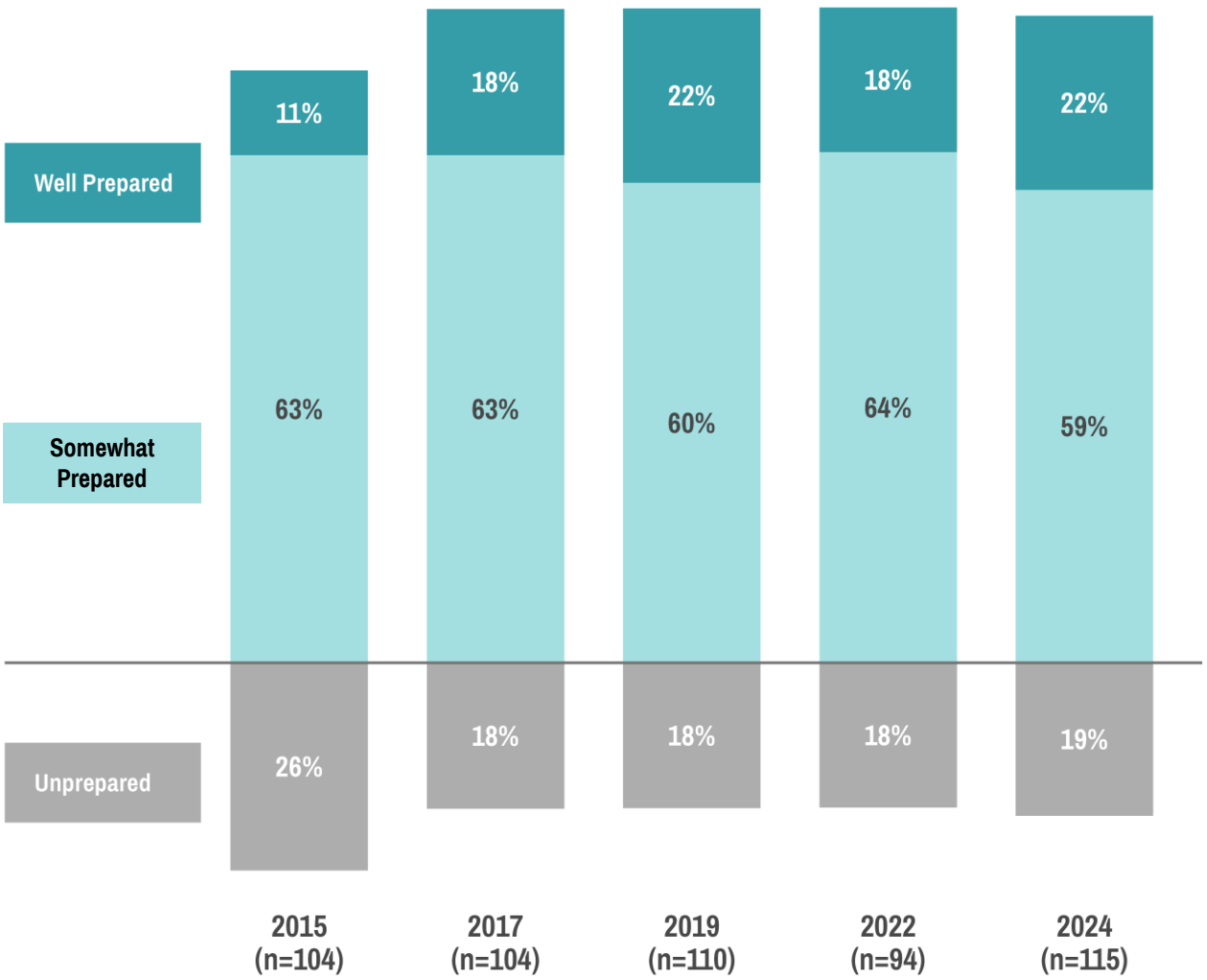
e) A plan to ensure opportunities for all students to engage in meaningful watershed educational experiences (MWEEs) at the elementary, middle and high school levels.

f) Established community partnerships for delivery of environmental education, including implementation of MWEEs.

LEA Preparedness: Trends Over Time

Changes in Environmental Literacy Preparedness Over Time (2015-2024)

State-wide preparedness levels in each of the ELIT years' reporting. Divergence illustrates the change in proportion of districts reporting any level of preparedness. Number of reporting districts may vary from year to year.



Most LEAs in Virginia (81%) are at least somewhat prepared to implement high quality environmental education in 2024.

Responding LEAs rated how fully their district has implemented the six indicators of planning and infrastructure for high quality EE. Total preparedness scores, across all indicators, were grouped into three levels of preparedness:

- Well Prepared: scores from 9-12
- Somewhat Prepared: scores from 4-8
- Not Prepared: scores from 0-3

In 2024, 81% of LEAs in Virginia scored as either somewhat or well prepared, with 19% of districts scored as not prepared. 22% reached the target metric of being well prepared.

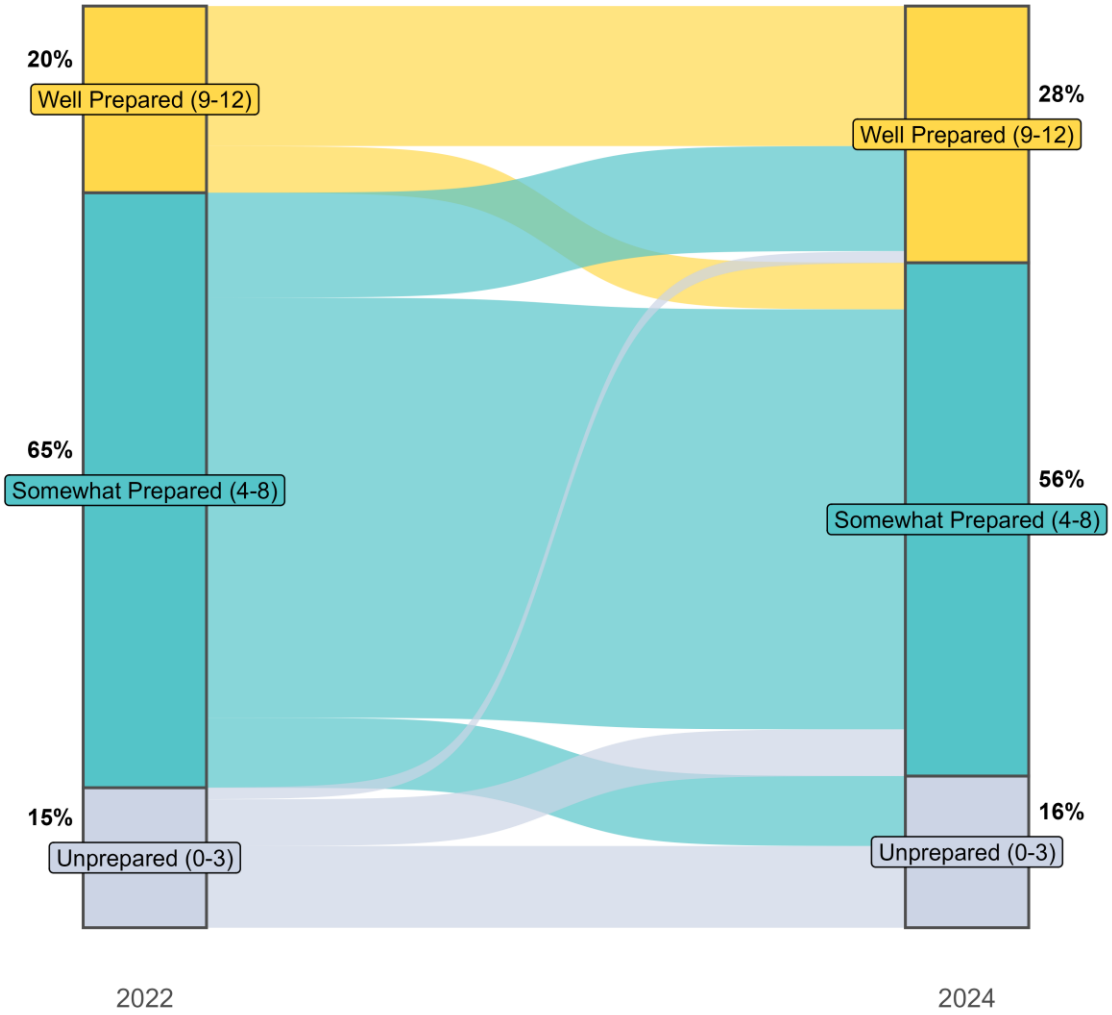
When we look at results from this indicator over time, we see only small variations in scores since 2017. 2024 tied with 2017's high of 22% well-prepared districts.

On the next page, we examine changes for just districts with paired 2022 and 2024 data, which provides a more nuanced look at changes that occurred.

LEA Preparedness: District Changes from 2022 to 2024

ELIT Preparedness: Pathways of Change between 2022 and 2024

This graphic shows how the planning level of individual school districts changed between the 2022 and 2024 ELIT. It includes only districts that responded to the survey in both years (n=79).



When we look only at districts for which we have reported data in both 2022 and 2024, we see that more LEAs reported being well prepared in 2024 – with an increase of 8 percentage points.

This analysis provides a clear picture of year-to-year change and pathways of movement in the metric by tracking each individual district that reported status in both years. Most districts maintained their level of preparedness over the two years. More districts rose to higher levels of preparedness (18%) than those which decreased in preparedness (13%).

When we look at the raw, total preparedness score (used to assign the levels) of all LEAs with paired data, **the average total score increased from 6.22 in 2022 to 6.33 in 2024**. This indicates an overall trend of school districts reporting more prepared items in place since 2022.

Breaking Down the Elements of Readiness

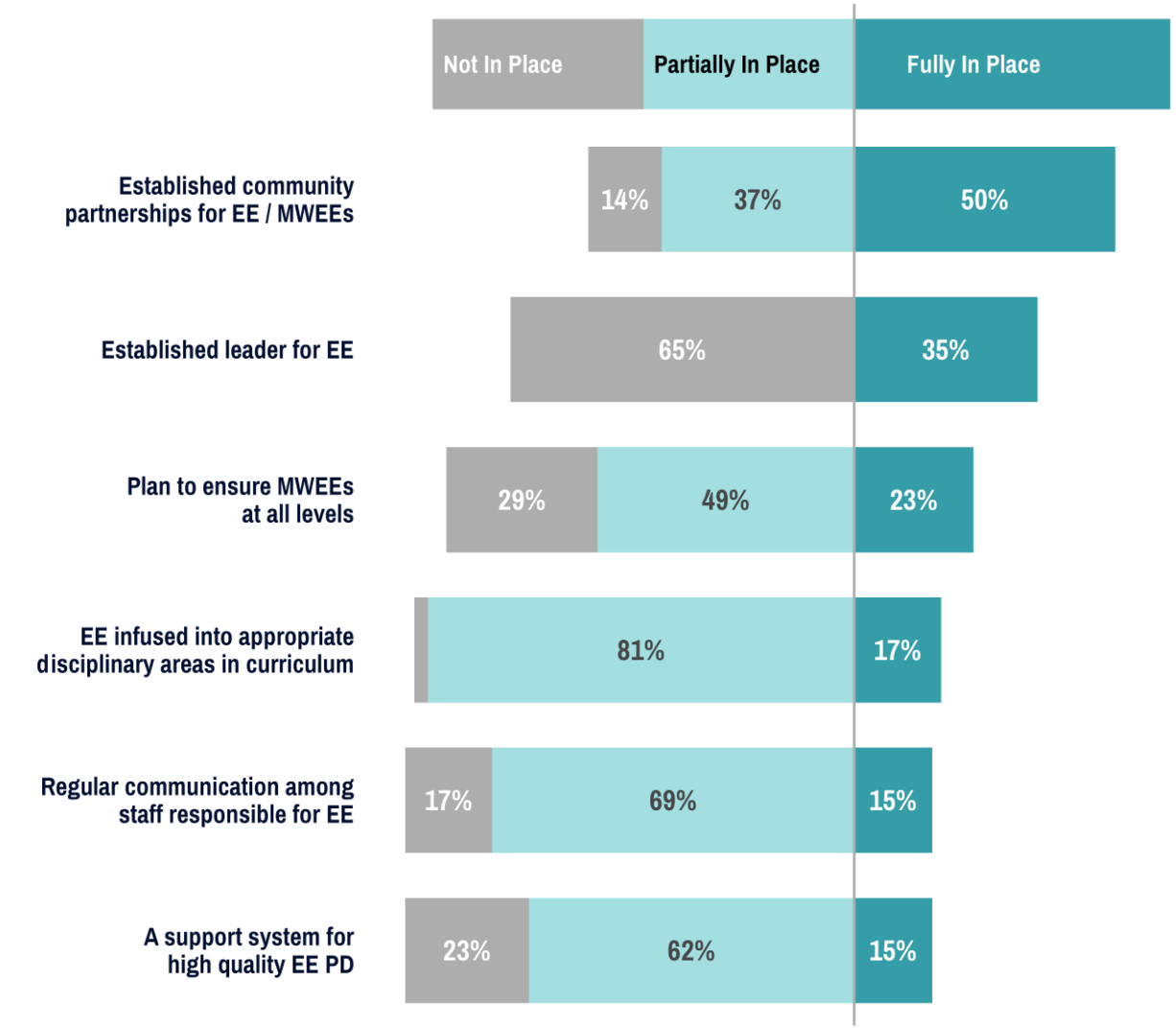
Half of Virginia LEAs reported having community partnerships for EE fully in place.

The breakdown of readiness within each element in the preparedness indicator show some trends in districts' strengths and challenges for planning. Similar to past years, creating an integrated program that infuses environmental topics across the curriculum is the area in which the greatest number of LEAs have made some progress (81%) but only 17% have fully achieved this element.

The next page further breaks down these data, by comparing the results within the three sub-groups (well-prepared, somewhat prepared, or unprepared). It suggests that establishing an EE leader and building community partnerships are areas in which less-prepared districts make early strides toward greater preparedness.

Degree of Readiness for Each Element of LEA Planning and Infrastructure.

Distribution of ratings to individual items in the planning indicator by all LEAs in Virginia (n=115)

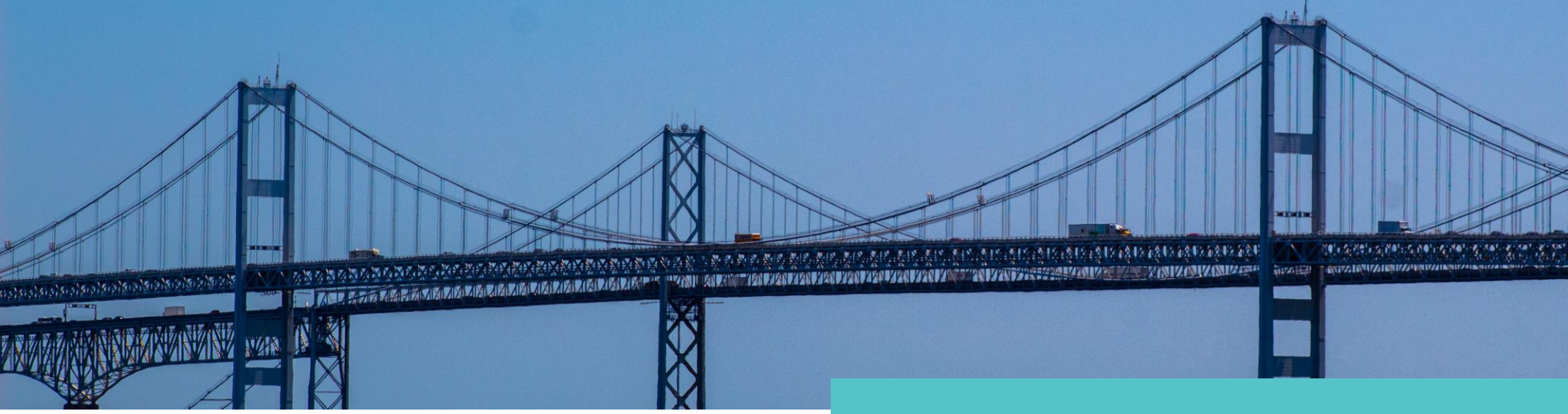


Elements Fully or Partially in Place

Comparing Strategies between Levels of Preparedness

RESULTS

Student Participation in Meaningful Watershed Educational Experiences (MWEEs)



RESULTS: STUDENT PARTICIPATION IN MWEES

Measurement

To assess the level of student participation in MWEEs within each LEA, respondents were asked to assess the presence of MWEEs within curricular offerings within each grade level (K-12), considering if they were system-wide or isolated to schools or classes. (See detail, right.) Respondents were given a reminder of the complete definition of a MWEE before the questions.

Although respondents reported at individual grade levels, analysis aggregated these data to report results by grade band (elementary, middle, or high school). The aggregation grouped each LEA into one of three levels within each grade band:

- At least one system-wide MWEE provided in the grade band;
- Some MWEE programming in the grade band, but not system-wide;
- No MWEE programming provided in the grade band.

For elementary (K-5) and middle school (6-8) grades, respondents indicated whether the district had:

- A system-wide MWEE experience for students in this grade
- Some schools or classes in this grade participate in MWEEs
- No evidence that students in this grade participate in a MWEE

For high school, MWEEs are more likely to correspond to a course than a grade level. Therefore, respondents reflected on courses at the high school level, indicated if the course was required or elective and whether the district had:

- A system-wide MWEE experience for students in this course
- Some schools or classes participate in MWEEs for this course
- No evidence that students in this course participate in a MWEE

The MWEE level was computed based only on courses that were indicated to be graduation requirements (i.e., needed for all students).

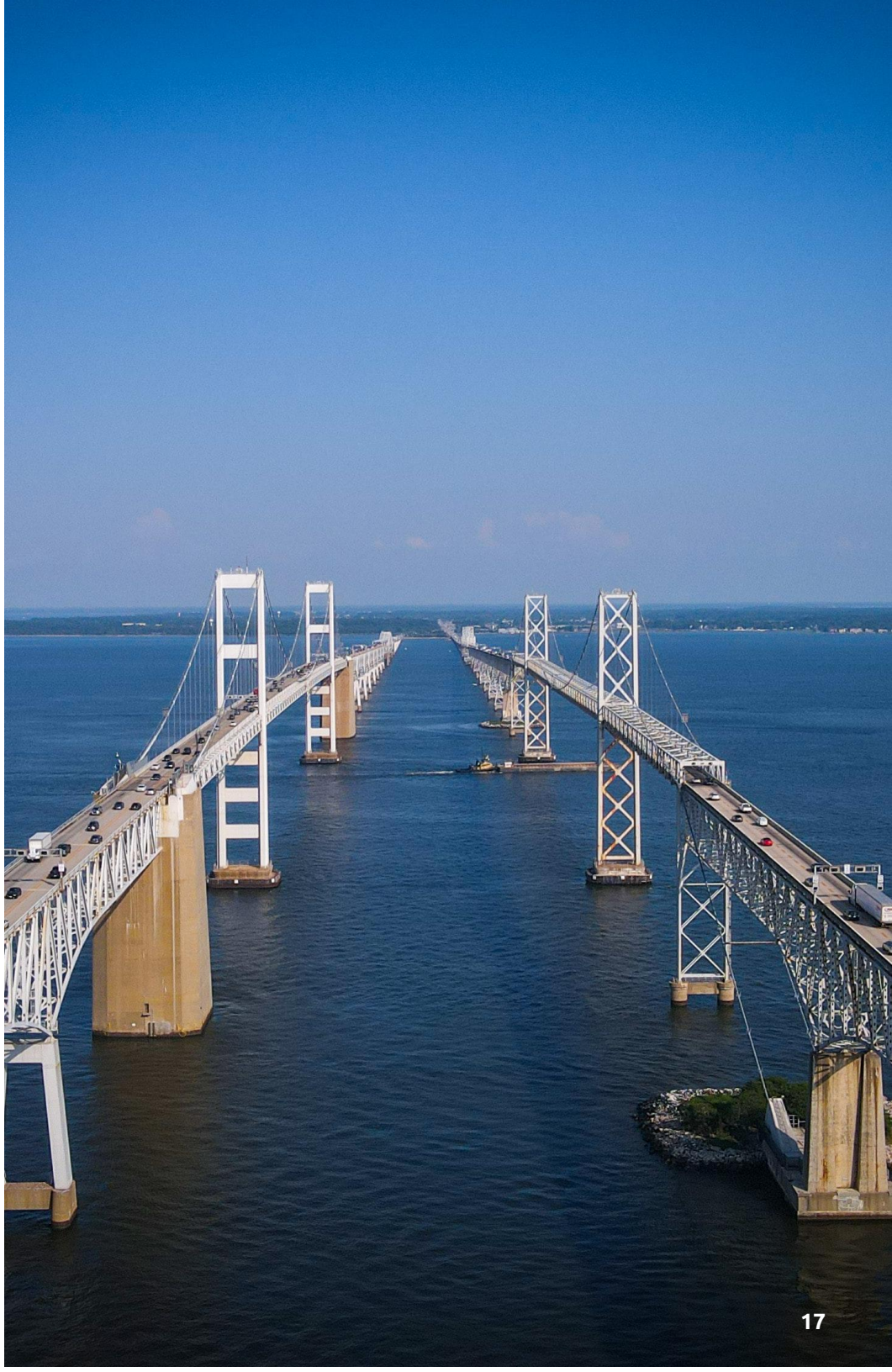
HS MWEE Measurement

The method for gathering data about high school MWEEs in 2024 was identical to the method used in 2022. However, the 2022 method was a shift from past years, as described below.

Early ELIT surveys received feedback that there may be inaccuracies in how high school courses were reported, particularly regarding clarifying whether MWEE reports were clearly limited to *required* courses (a critical element to be "system-wide"). For example, an AP course might be listed as a system-wide MWEE; but as AP course are electives, it indicated that early ELIT reports may have conflated requirements and electives.

In 2022, the question provided LEAs with an inventory of specific, common subjects, including: biology, chemistry, physics, Earth/ environmental science, history, government/civics, geography, algebra I, algebra II, geometry, language arts, literature, health/physical education, AP science, AP English, AP math, AP history, with space for write-in courses. LEA representatives reported the presence of MWEEs in each of these courses (system-wide, some schools, no evidence) – *regardless* of if it was required or elective. This allowed LEAs to focus on course topics.

A secondary question provided the same list of subjects and asked them to indicate which courses were graduation requirements. Analysis used this response to distinguish if each MWEE rating (above) pertained to a requirement (for the indicator) or an elective.



Student Participation in MWEEs

System-wide MWEEs were most common at middle school, present within 45% of responding LEAs, followed by elementary grades, which saw 40% of LEAs reporting system-wide MWEEs.

Virginia is showing reasonably strong results at all three levels, with over one-third of LEAs reporting the presence of system-wide MWEEs. The state also has many LEAs reporting at least some MWEE incorporation, even if it doesn't reach the level of being system-wide.

On the next page, results from ELIT years 2017 through 2024 are compared. Overall, rates of system-wide MWEEs increased. The greatest positive change seen in high school, where there was also a decrease in the rates of LEAs with some MWEEs in place and a lack of MWEEs.

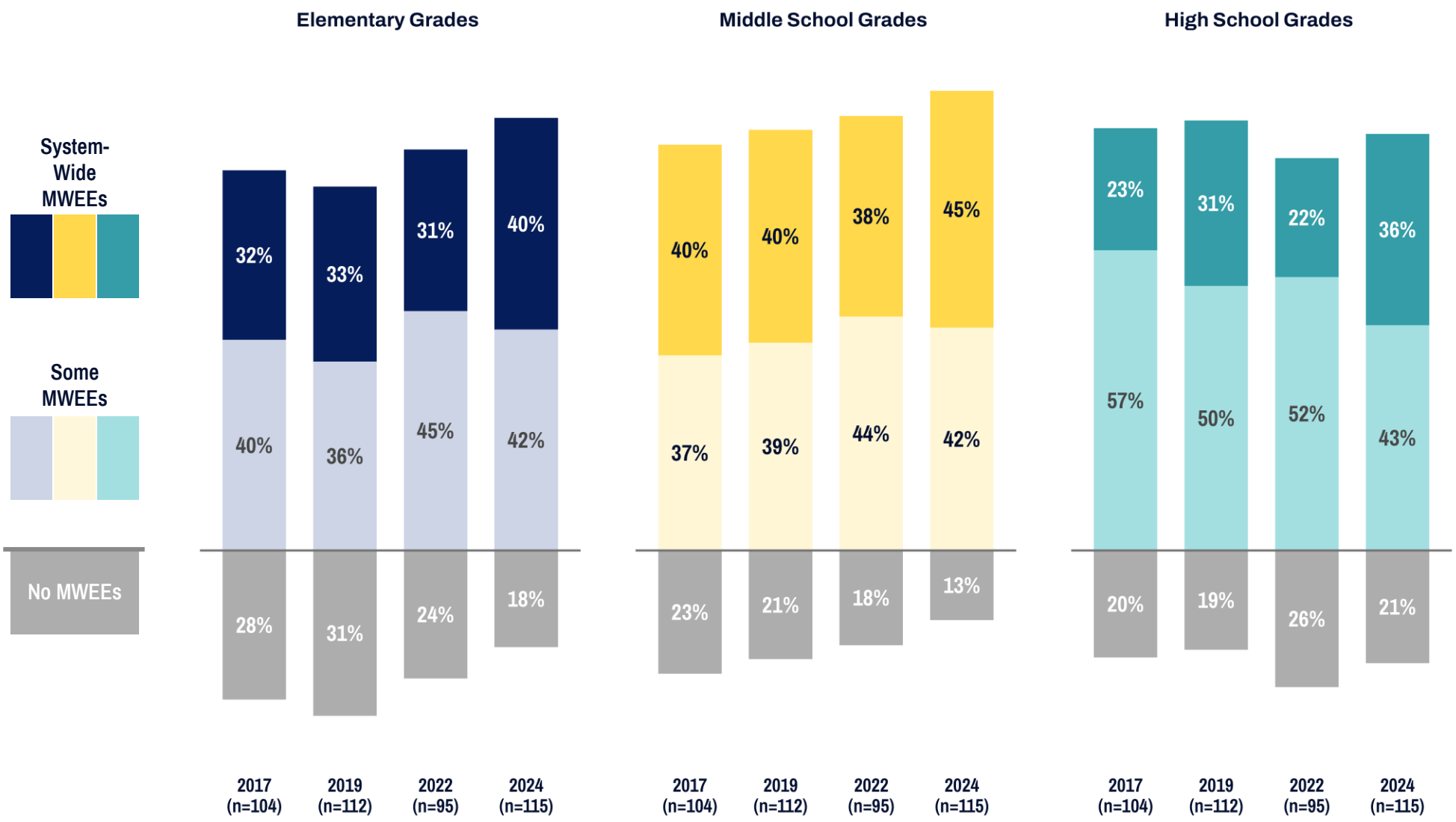
Both elementary schools and middle schools continued positive growth since 2019. Each year, fewer LEAs have reported no MWEEs at elementary and middle school levels. The overall trend of system-wide MWEEs for these grade bands has also steadily increased, with 2024 continuing the trend.

MWEE Availability among LEAs within Virginia in 2024

Rates of availability across all responding LEAs. If a district reported there was a system-wide MWEE at any grade level(s), they were scored as having "System-Wide MWEEs"; "No MWEEs" indicates no MWEEs at any grade in the band.

Note: sample sizes reflect the number of LEAs that answered question(s) for each grade band. LEAs that do not respond to some items result in varying sample sizes.

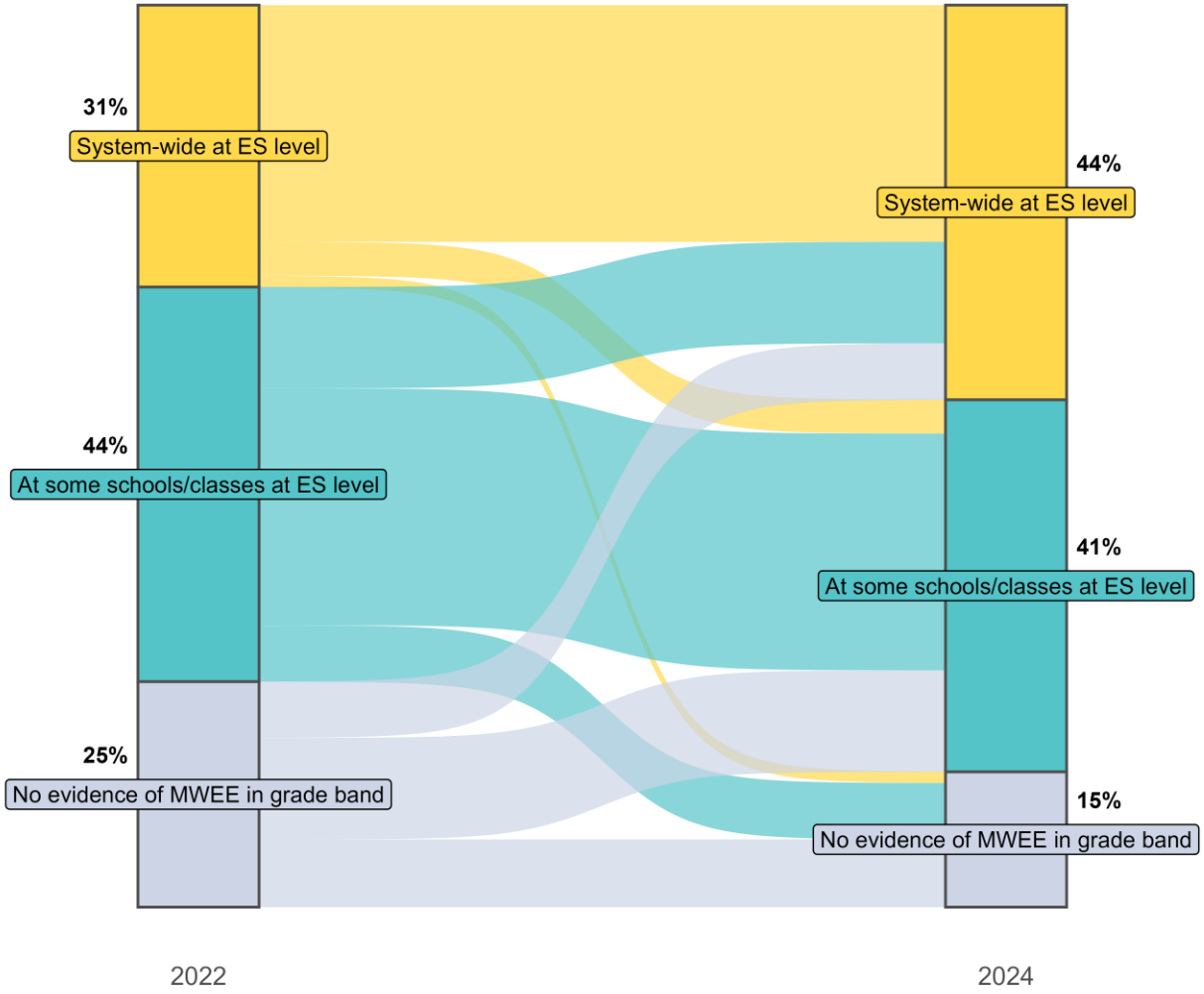
MWEEs by Grade Band: Change Over Time



Change in Elementary: Paired 2022 and 2024 Data

ES MWEEs: Pathways of Change between 2022 and 2024

This graphic shows how the presence of MWEEs of individual school districts changed between the 2022 and 2024 ELIT. It includes only districts that responded to the survey in both years (n=80).



Exploring the subset of LEAs for which we have year-to-year data, we see movement between all levels of MWEE availability. LEAs that reported system-wide MWEEs in elementary grades increased by 13 percentage points.

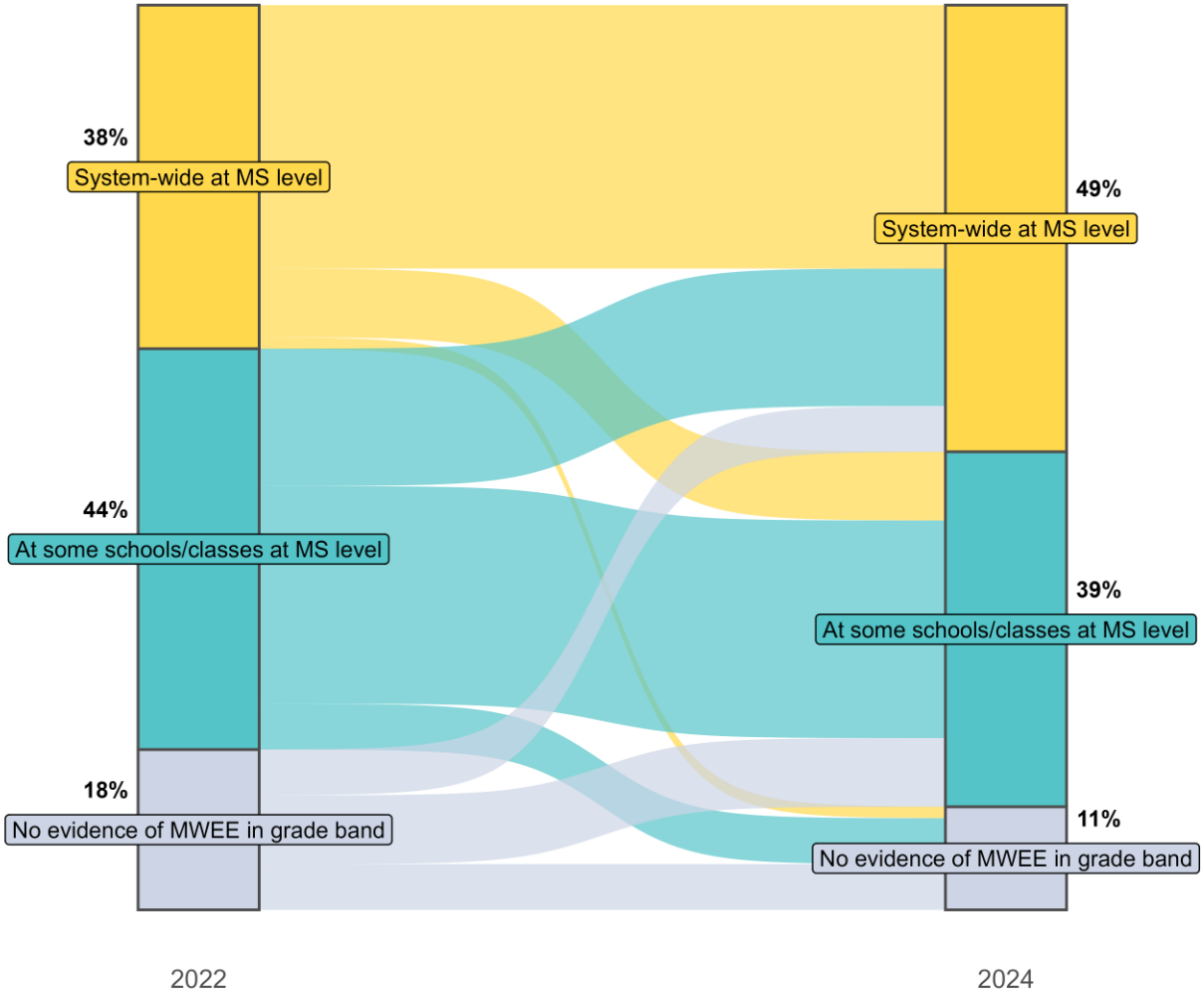
As the frequency of system-wide MWEEs increased, the number of LEAs reporting no MWEEs decreased by 10 percentage points. These were all positive trends.

As is illustrated here, the movement between levels is more complex. While most LEAS reported no changes in MWEE presence at the elementary grade band since 2022, the pathways show that 29% of LEAs increased their level of achievement, while 11% reported a decrease in their MWEE level.

Change in Middle School: Paired 2022 and 2024 Data

MS MWEEs: Pathways of Change between 2022 and 2024

This graphic shows how the presence of MWEEs of individual school districts changed between the 2022 and 2024 ELIT. It includes only districts that responded to the survey in both years (n=79).



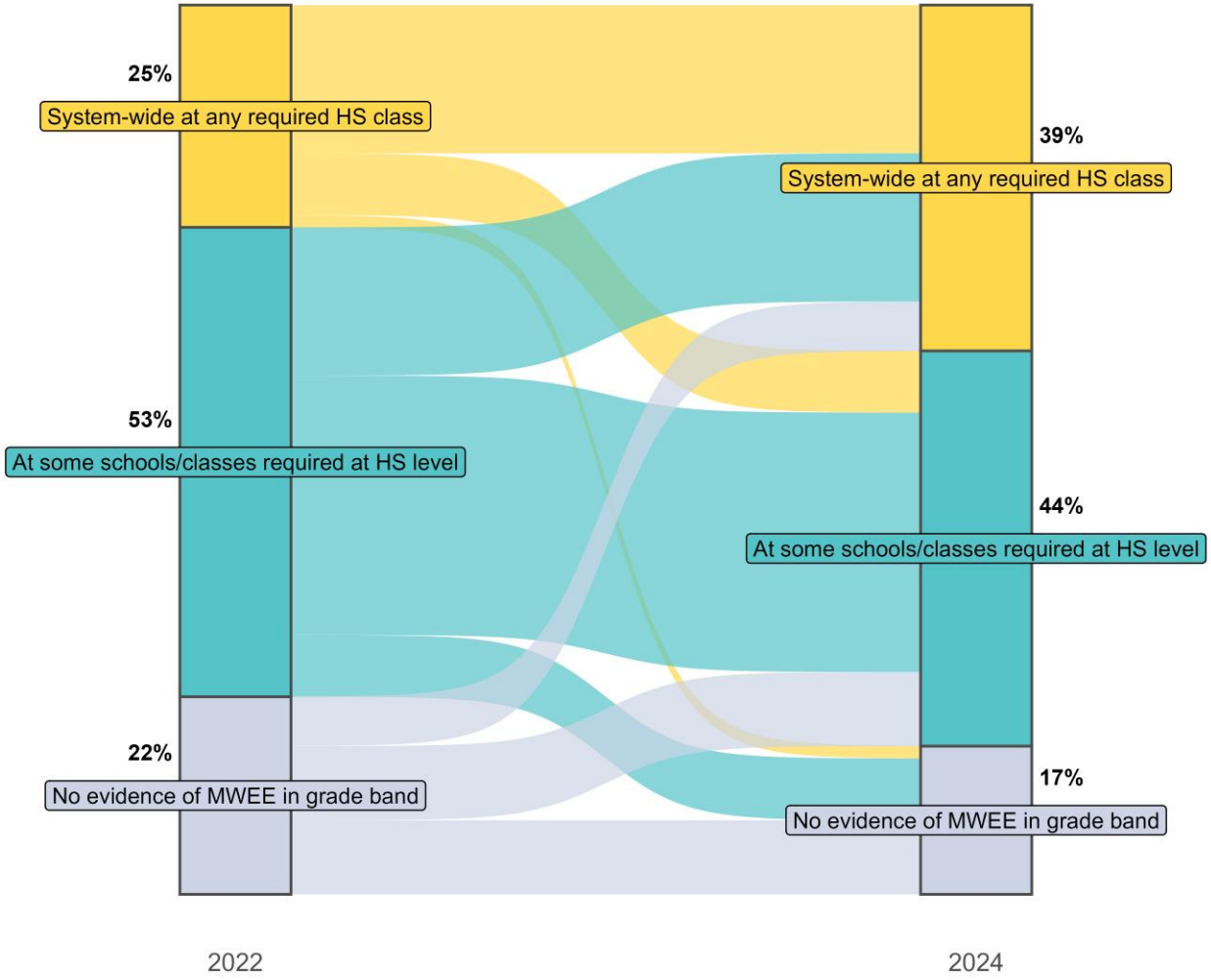
For the subset of LEAs with year-to-year data, we saw a substantial increase in the overall proportion of system-wide MWEEs in middle school – increasing by 11 percentage points in 2024.

Once again, more than half of the LEAs reported no changes in MWEE presence at the middle school level since 2022. However, the pathway diagram highlights the complexity of movement between the levels from year-to-year. In aggregate, 28% of LEAs moved to a higher level of MWEE implementation in 2024, while 14% reported a decrease in attainment.

Change in High School: Paired 2022 and 2024 Data

HS MWEEs: Pathways of Change between 2022 and 2024

This graphic shows how the presence of MWEEs of individual school districts changed between the 2022 and 2024 ELIT. It includes only districts that responded to the survey in both years (n=72).



Within the subset of LEAs with paired data, we see that there was very strong improvement at the high school level with an increase of 14 percentage points in LEAs with system-wide MWEEs since 2022.

Just over half of the LEAs reported that their MWEE level stayed stable at high school since 2022. For the other half of LEAs, twice as many moved up to a higher MWEE level (31%) as those that moved to a lower level of MWEE use (15%).

High School: Required Courses Using MWEEs

Of the 85 LEAs that reported having at least some MWEE experiences within required high school course(s), most tended to be within science courses.

Biology was by far the most common required subject that incorporated MWEEs – whether in individual courses or system-wide. Environmental science was another common required course for MWEEs at the high school level.

Notably, rates of environmental science as a required MWEE increased in 2024 after a dip in 2022 (currently 65%, from 55% in 2022).

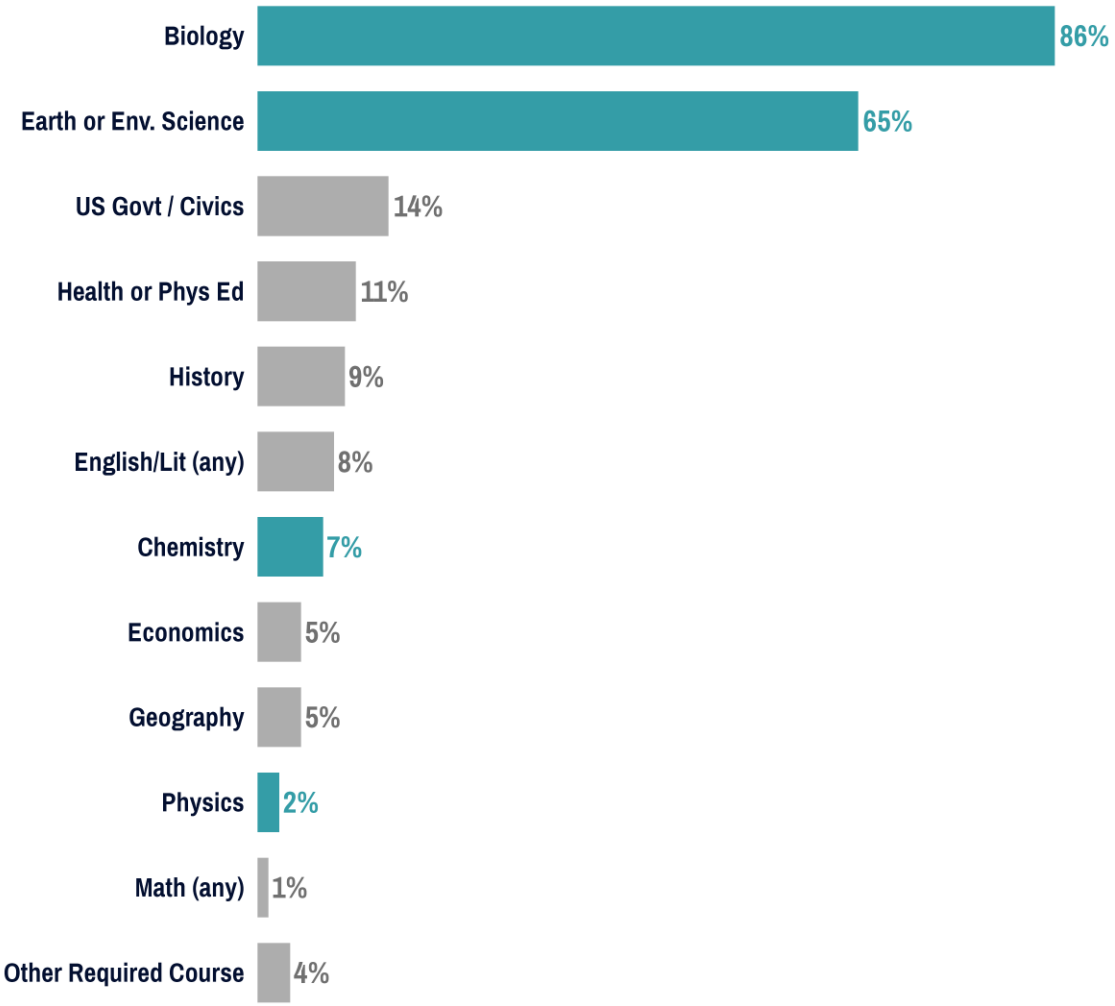
Among required non-science courses, US government and civics, physical education and history were the most common subjects for a MWEE to be present. Some English courses were combined in the graph here for clarity.

Three districts listed "other required courses" that use MWEEs, which included "Bio II: Ecology," "Biology 101 and 102 Dual Enrollment," and "ESP course."

Note: These data include all responses in the 2024 ELIT dataset (not only those LEAs that reported in both years).

Percentage of LEAs that Provide MWEEs within Each Required Subject (n=85)

Sample is just of LEAs that reported having MWEE(s) in at least one required high school course. Data rely on accurate self-reports that courses are requirements. Teal-colored bars indicate science-focused courses (the most common broad subject area); gray bars indicate non-science courses.



High School: Elective Courses Using MWEEs

68 Virginia LEAs reported offering MWEEs within high school elective courses; most of these were in AP science courses or environmental science.

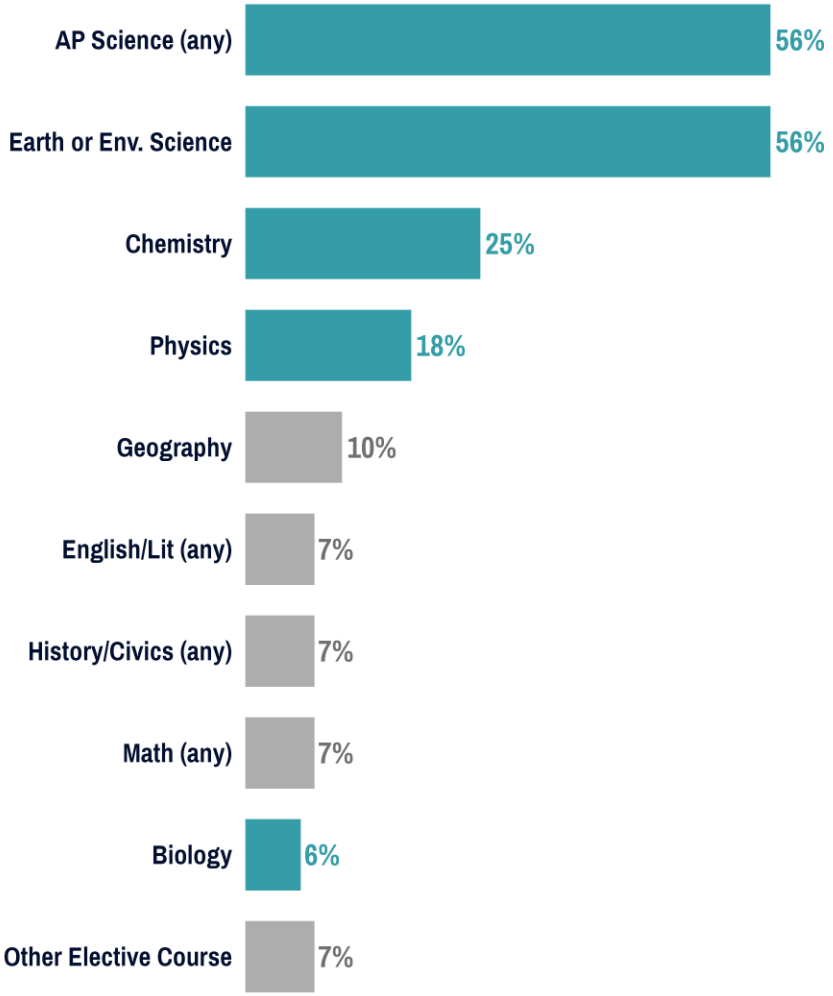
The top 4 most common elective subjects that included a MWEE were all science courses. Other non-science elective courses included geography, English, history, and mathematics. Virginia had an especially high rate of AP classes that included MWEEs; these are combined with their non-AP counterparts in the graph here for clarity.

All of the AP Science courses indicated the MWEEs were either AP Environmental Science or AP Biology. Other AP subjects that were written in as having MWEEs included AP Human Geography and AP Government.

Two districts listed “other electives” that use MWEEs. These two electives identified were Marine Biology and Fisheries and Wildlife Management.

Percentage of LEAs that Provide MWEEs within Each Elective Subject (n=68)

Sample is just of LEAs that reported having MWEE(s) in at least one elective high school course. Data relies on accurate self-reports that courses are requirements. Teal-colored bars indicate science-focused courses (the most common broad subject area); gray bars indicate non-science courses.



RESULTS

Environmental Education Support Needs

Greatest Needs for EE Support

In Virginia, funding for programming and supplies was rated as the greatest need, on average, but only by a small margin.

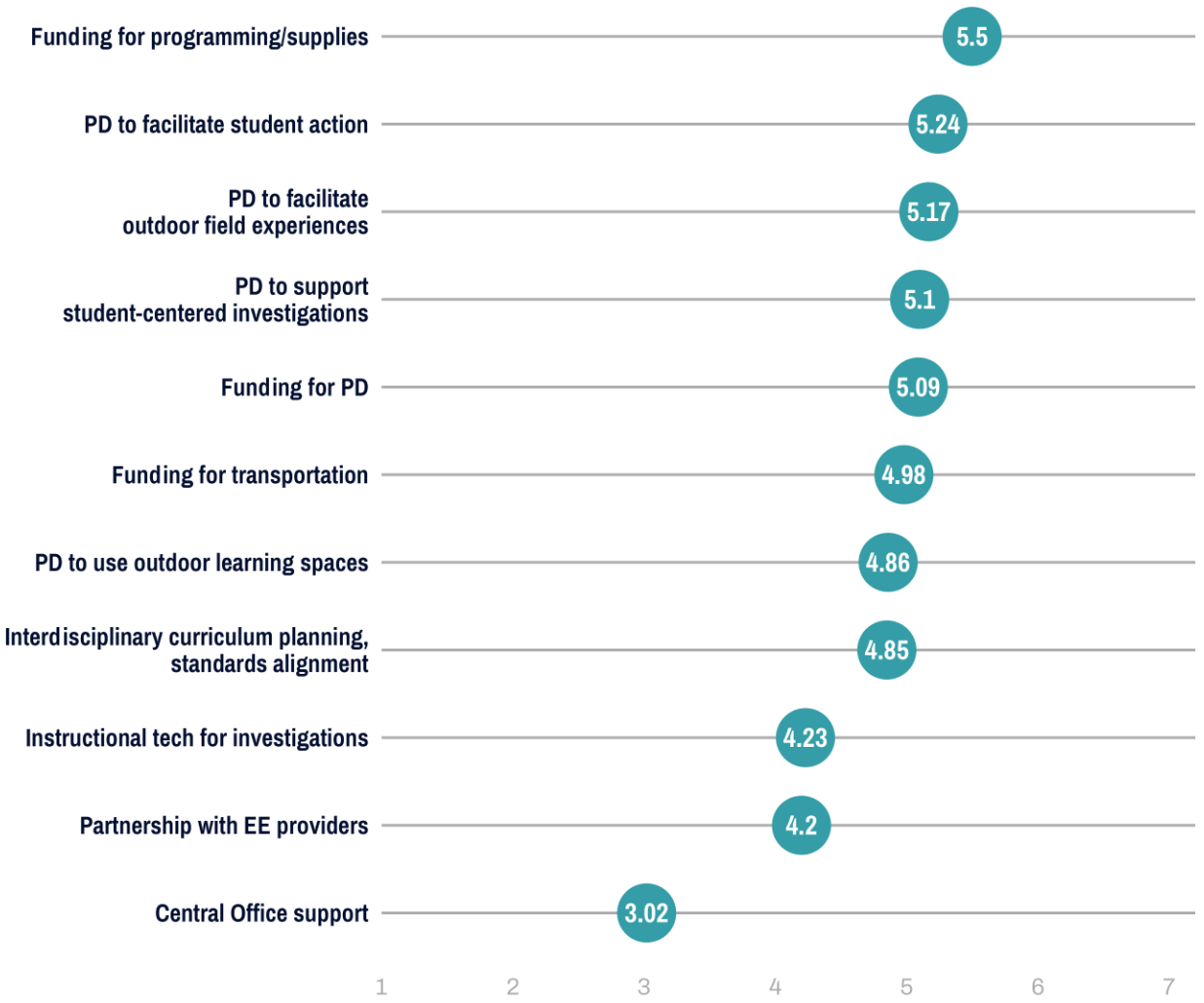
Notably, most of the items focused on supporting teacher professional development (PD) were rated as the most highly needed across LEAs beyond funding for programming and supplies. Support from the central office / administration was rated the lowest need, by far. There also seemed to be less need for instructional technology or partnerships.

Several respondents wrote in "other needs" including:

- *"Administrator approval"*
- *"Bus drivers so that using school buses would be possible"*
- *"Dedicated time allotted for MWEE training"*
- *"Instructional time"*
- *"Support for facilitators (FTE)"*
- *"Embedded environmental learning progressions"*
- *"Funding for staff"*
- *"More time to teach science in elementary"*
- *"Support for sustainability"*
- *"School admin support"*
- *"Time"*

Average Ratings of Need for Support in Each Area Statewide

Responding LEAs rated their level of need for support in each area from 1 to 7, with 7 being the greatest need. Number of respondents to each item varies because some LEAs skipped items (n=108-112).



All images in this report courtesy of Unsplash, including work from photographers:

Chris Liu-Beers
Liz Guertin
Max Shein
Bob Burkhard
Ashley Hajimirsadeghi
Mary Oakey
Taylor Cole
Sara Cottle

J. Sickler CONSULTING

For more information about this report, contact:

Jessica Sickler
J. Sickler Consulting
jessica@jsickler.net

Shannon Sprague
NOAA, Chesapeake Bay Office
Shannon.Sprague@noaa.gov