# Chesapeake Bay Watershed 2022 Environmental Literacy Report

## Virginia

### Results from the ELIT Survey

**Report: 4/10/2023**

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## Study Purpose & Methods

# ELIT Background & Purpose

**The Chesapeake Bay Watershed 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 was modified in 2022 to reduce the reporting burden on school districts. In this revision, questions about sustainable school practices were eliminated, as relevant data can be obtained through other means.

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 typically 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-points that are more reliably obtained through non-survey means (e.g., in/out of watershed; student enrollment) are identified from external sources and merged with the survey responses.

Past ELIT data were collected in 2015, 2017, and 2019. Collection was paused in 2021, due to the substantial impacts on school districts due to the COVID-19 pandemic. Collection resumed in 2022 to assess where the region stands in the wake of these impacts on education systems.

NOAA's Chesapeake Bay Program organized data collection in 2022, and 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 only includes responses from public school districts that fall within the Chesapeake Bay Watershed.

## Data Collection Timing

The 2022 ELIT asked districts to report on the status of activities for the 2021-22 school year. To support this, the ELIT survey opened for responses in May 2022. The survey remained open for responses through the spring and summer. In response to demand from several states and LEAs for more time to complete the survey, the deadline for completion was extended through the end of November 2022.

## Additional Information about Data

The most significant challenge of the ELIT is obtaining a strong response rate from more than 300 LEAs across six states. As greater numbers of LEAs report their activities into this dataset, the Chesapeake Bay Program has a more accurate understanding of the status of environmental literacy activities across the watershed.

The 2019 dataset, which is included in this report when comparing results year-to-year, was a combined dataset that included all 2019 districts that responded, as well as appending any 2017 data from districts that had not updated their responses in 2019. The underlying assumption was that changes in status within non-reporting districts was likely minor over the course of two years (as ELIT change tends to be incremental). This provided a more robust picture of the region at that time.

In 2022, because the last ELIT was three years ago, and in those three years there were many, major shifts in all aspects of education systems, we did not append this year's data with any historic data. All data are only what was reported this year.

# 2022 ELIT Response Rate

**95 out of 137 LEAs in Virginia completed the ELIT survey in 2022. This constituted a response rate of 69% of all districts, and represented 83% of enrolled students in the state.**

Virginia's response rate was higher in 2022 than it was in 2019 (when only 55% of districts responded to the survey). While a very large proportion of total enrolled students are represented in the 2022 dataset, around a third of Virginia LEAs are not included. This indicates that the data presented here should be taken as widely, but not quite fully, representing environmental literacy efforts statewide.

**ELIT Response Rate: Percentage of all LEAs and of Enrolled Students across Virginia in 2022**

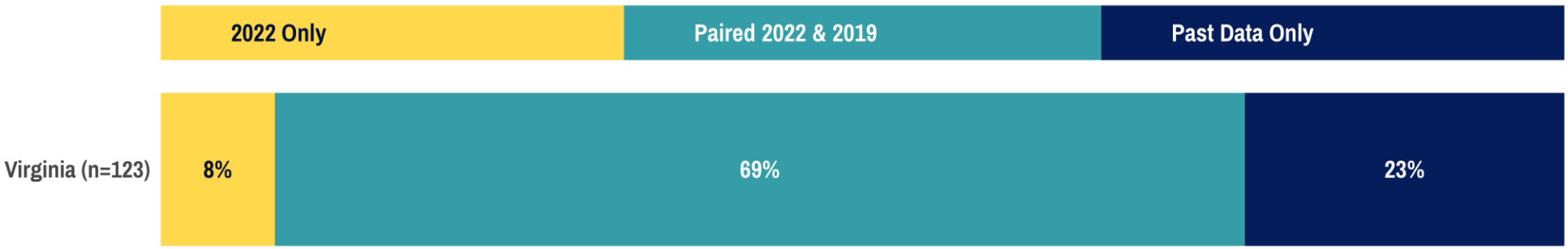
# Availability of Paired Year-to-Year Data

**Nearly all of the LEAs in Virginia that responded in 2022 also completed the ELIT in 2019. This means that comparisons of year-to-year changes are likely a very 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 may have occurred over past years. By isolating comparisons to districts that responded in both current and previous years, we can look at the number of districts who reported increases or decreases in indicators in the past three years.

### Repeat ELIT Respondents: Availability of Paired Year-to-Year Data

This graph considers the full, historic dataset of ELIT responses in Virginia. Segments of the graph show the proportion of districts that were entirely new to ELIT reporting this year, those that have responded at both periods, and those who responded previously, but did not update their data in 2022



# Staff Responsible for Sustainable Schools

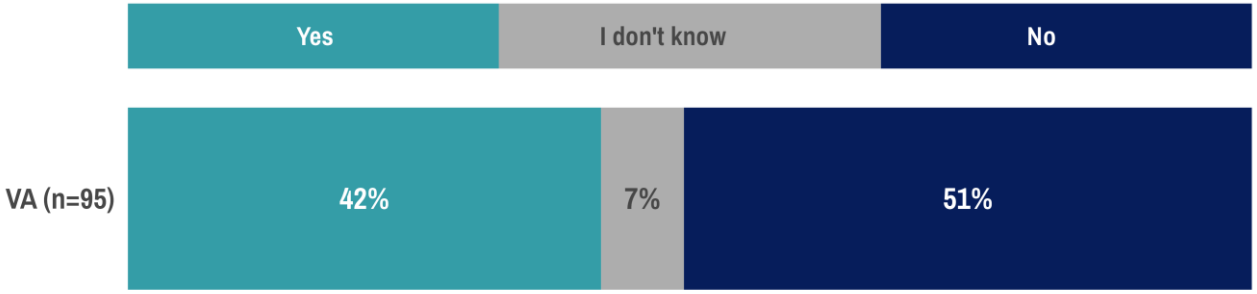
**Nearly half of the responding LEAs indicated that their district has dedicated staff responsible for sustainable schools.**

The 2022 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 moderate rate, with 40 out of 95 LEAs having a dedicated staff person 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.

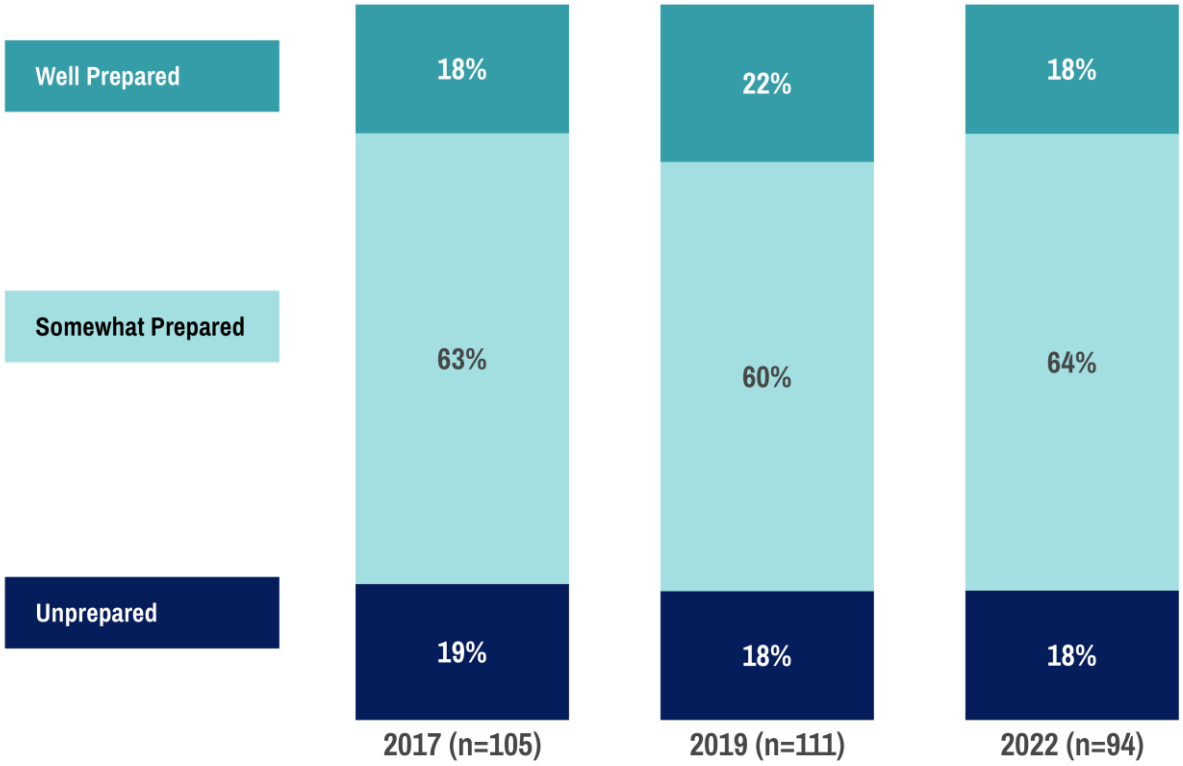
e) A plan to ensure opportunities for all students to engage in meaningful watershed educational experiences (MWEEs) at the elementary, middle and high school levels.

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 (2017-2022)

Preparedness levels in all reporting LEAs in Virginia




### Comparing Paired 2019 and 2022 Data

Changes in preparedness within individual LEAs for which we have paired data within Virginia (n=82).


**Most LEAs in Virginia (64%) are somewhat prepared to implement high quality environmental education in 2022.**

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

Looking at the aggregate numbers, the rate of well-prepared districts fell slightly from 2019 to 2022, but the number of districts that are somewhat prepared increased. The rates of unprepared LEAs stayed stable.

Exploring the subset of LEAs for which we have year-to-year data, nearly three-quarters of districts stayed at the same level. For those who did shift in the last few years, slightly more districts shifted to a lower level of preparedness than shifted to a higher level of preparedness.

# Breaking Down the Elements of Readiness

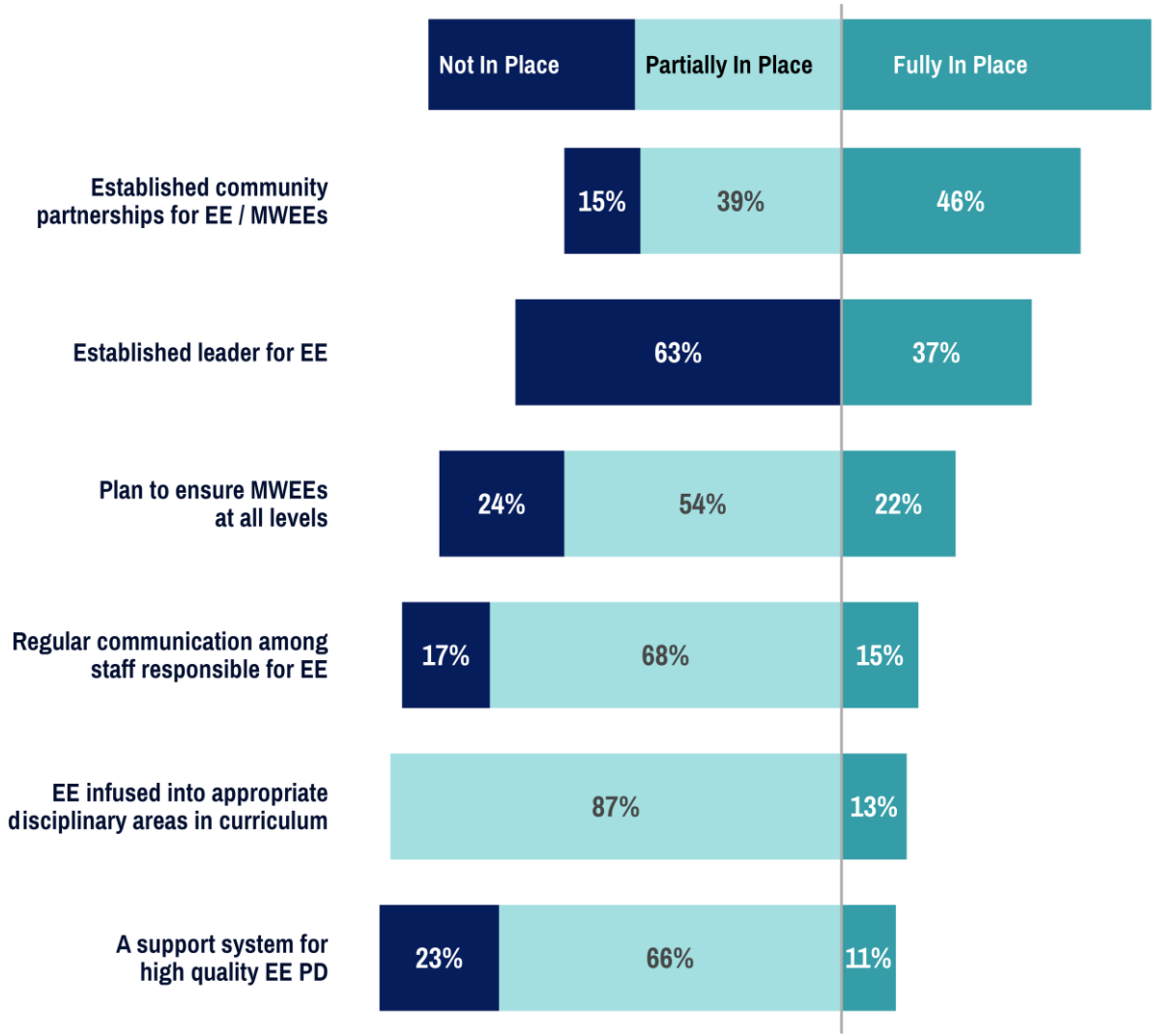
**Nearly half of Virginia LEAs reported having community partnerships for EE fully in place.**

The breakdown of readiness within each element in the preparedness indicator show some trends in districts' strengths and challenges for planning. Similar to 2017 and 2019, 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 (87%) but only 13% have fully achieved this element.

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

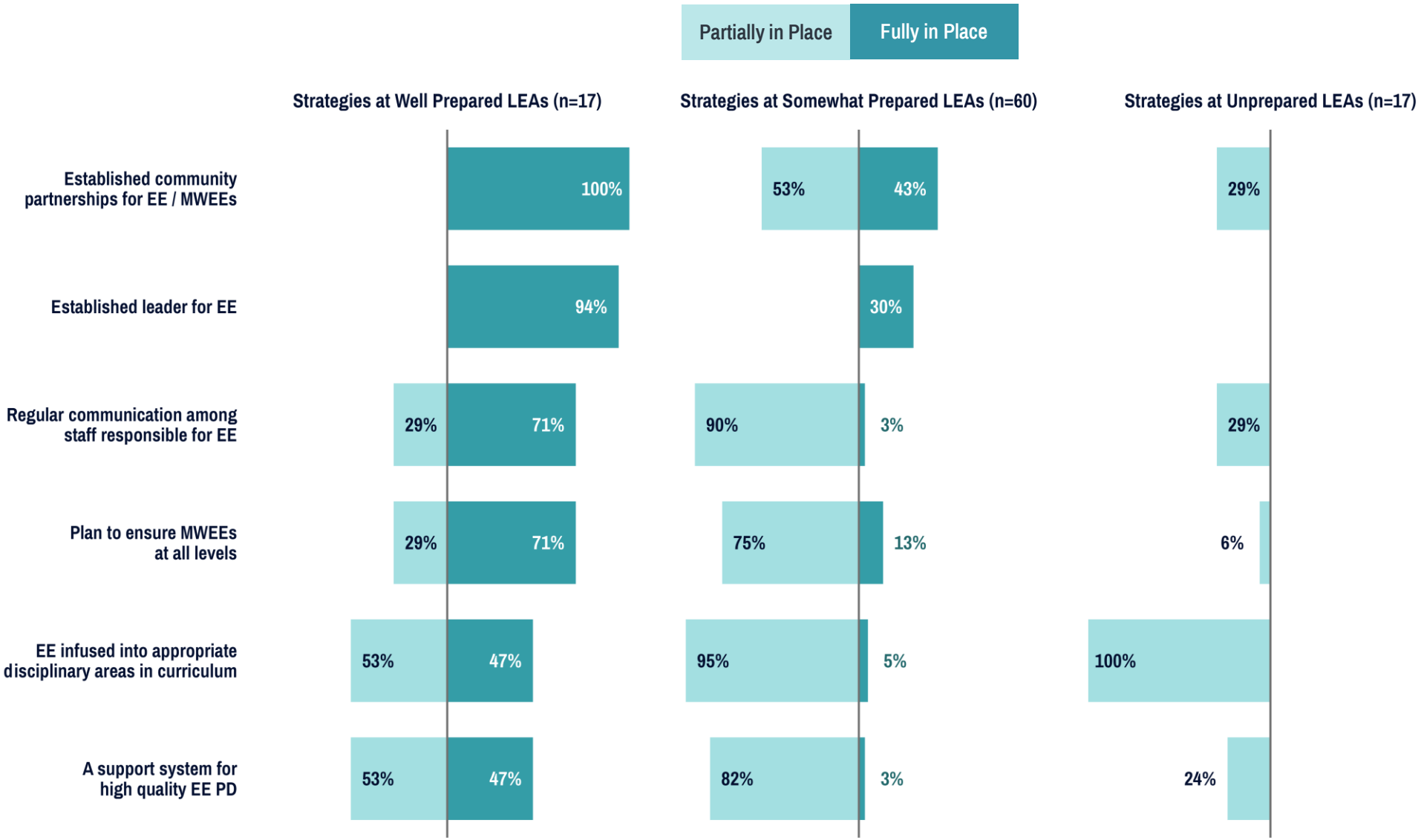
**Degree of Readiness for Each Element of LEA Planning and Infrastructure.**

Distribution of ratings to individual items in the planning indicator by all LEAs in Virginia (n=95)



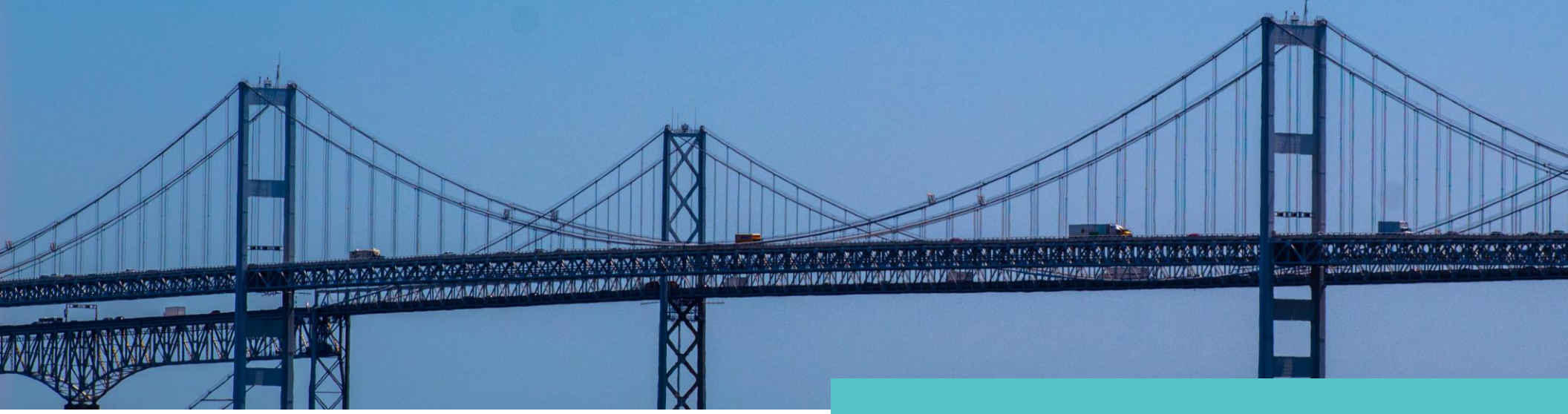
# Elements Fully or Partially in Place

## 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).

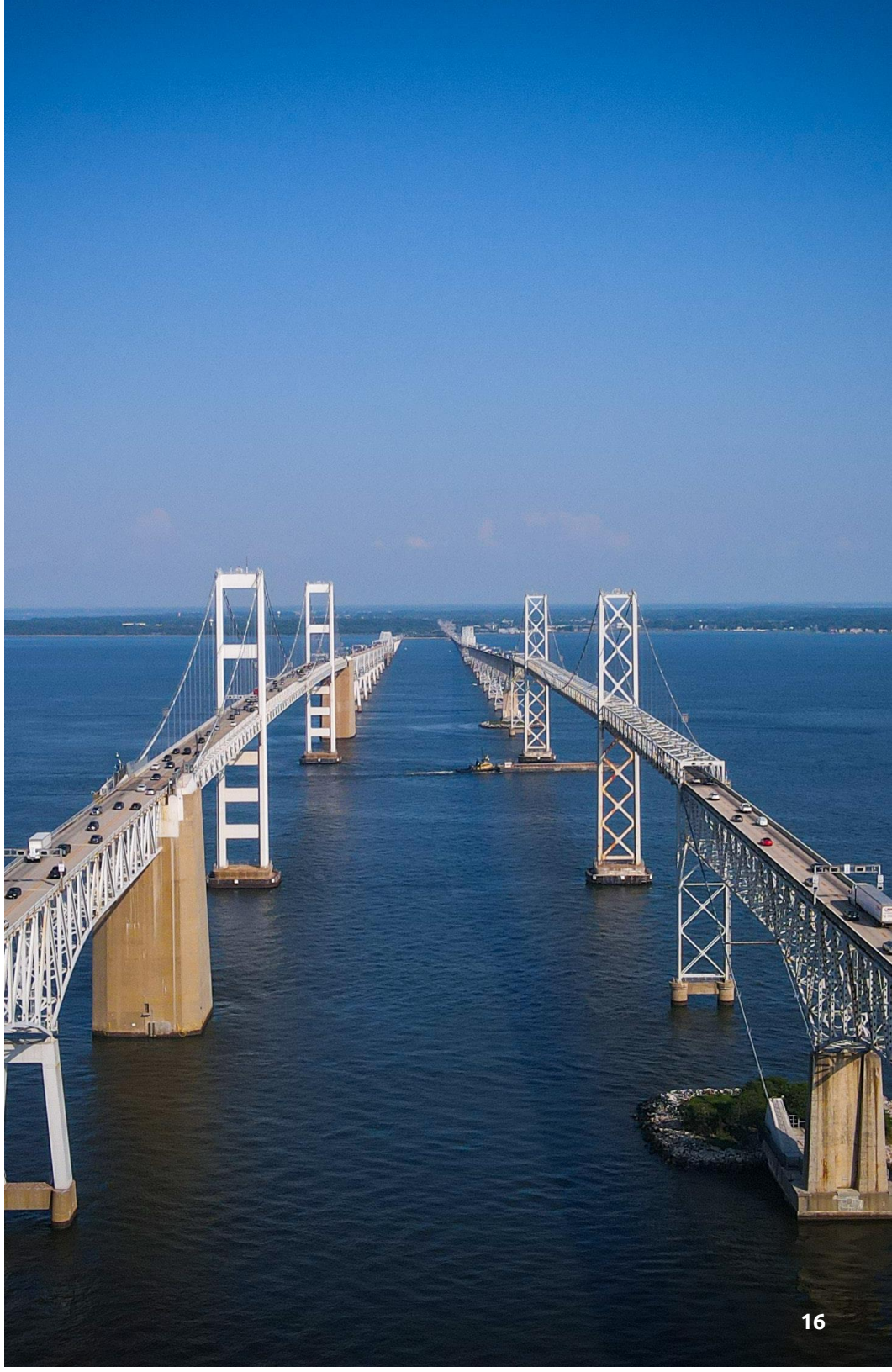
# HS MWEE Measurement

**A change was made to how data about high school MWEEs was collected in 2022, in an effort to make it easier on LEAs and improve accuracy of what was reported.**

In past years' ELIT survey, data suggested there may be inaccuracies in how courses were reported, particularly regarding clarifying whether MWEE reporting was clearly limited to *required* courses (a critical part of being considered system-wide). For example, an AP course might be listed as a system-wide MWEE, which indicates the task of focusing on requirements and electives separately was difficult for LEAs to do.

In 2022, the question was streamlined, providing LEAs with an inventory of more specific 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 core subjects (without AP items) 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. Of note, 11 early survey respondents from Virginia saw an incorrect version of this question; they could only select one required course. These data were carefully reviewed, and this error potentially affected the MWEE score of just 3 districts. These districts were removed from analysis of MWEE scores to not artificially deflate results.



# Student Participation in MWEEs

**System-wide MWEEs were most common at the middle school level, at 38% of responding LEAs.**

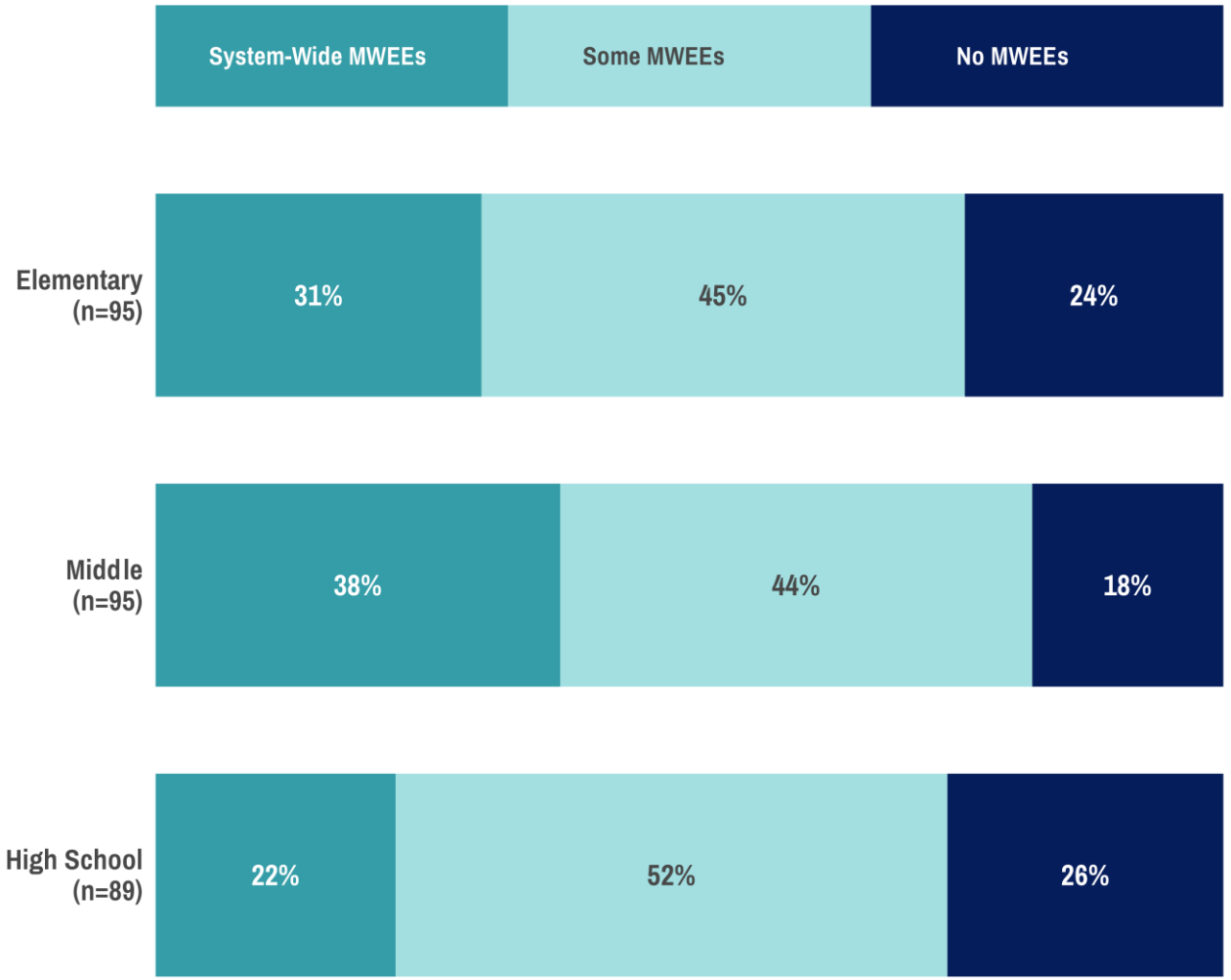
Virginia continues to be distinctive for having more system-wide MWEEs in middle school than the other grades. On the next page, we compare 2017, 2019, and 2022 results.

Overall, rates of system-wide MWEEs decreased. This decrease was very slight in elementary and middle school grade bands, where there was also an increase in the rates of LEAs with some MWEEs in place (and a decrease in the proportion of LEAs with no MWEEs at all). This continued a trend established in 2019.

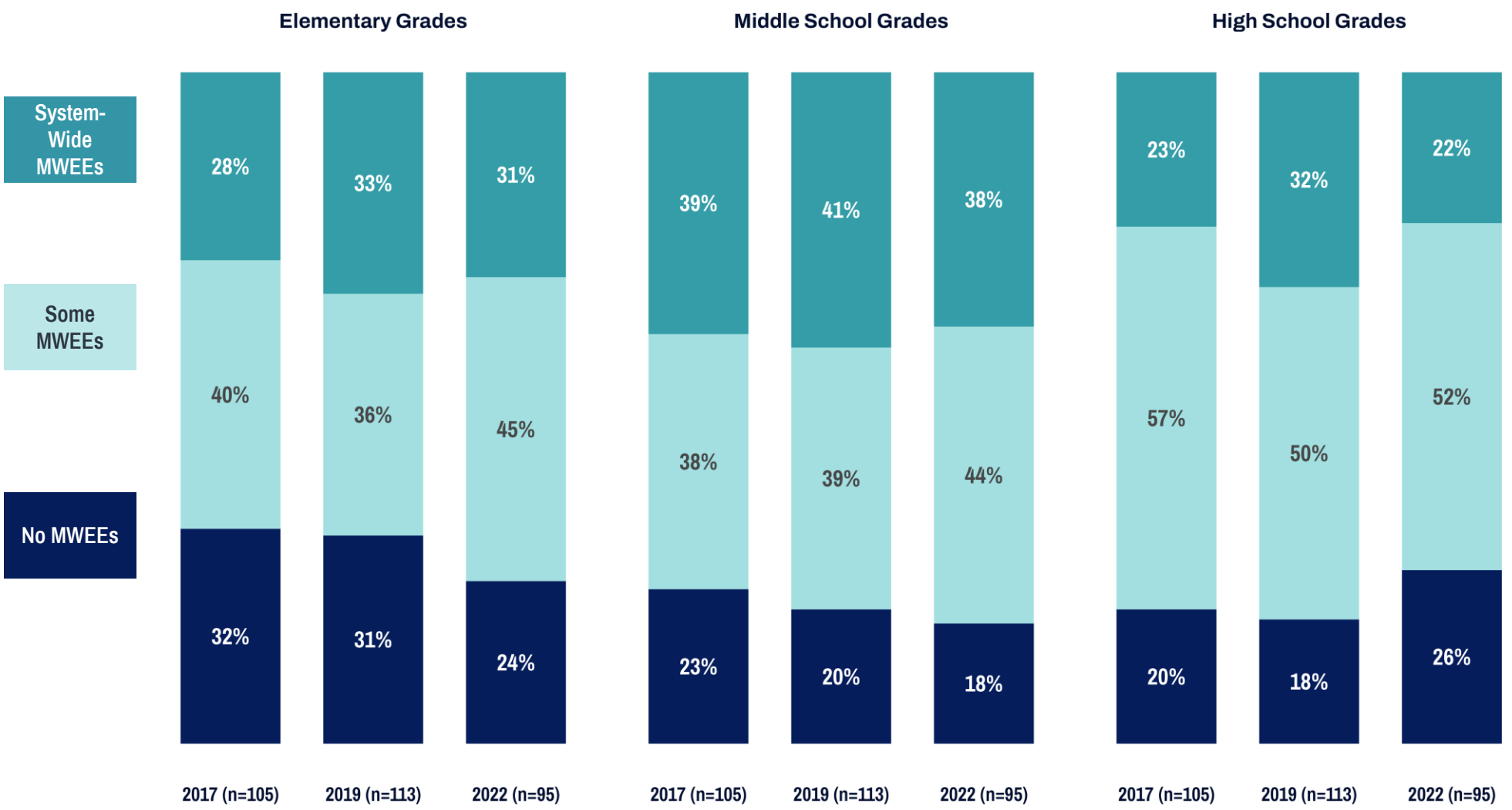
The decrease in MWEE rates in high school grades was more pronounced, with a decrease of ten percentage points in the number of LEAs with system-wide MWEEs at the high school level. While there was a slight increase in the percentage of LEAs with some MWEEs at high school, overall there was a greater increase in the number reporting no high school MWEEs at all.

### MWEE Availability among LEAs within Virginia in 2022

Rates of availability across all resopnding 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.



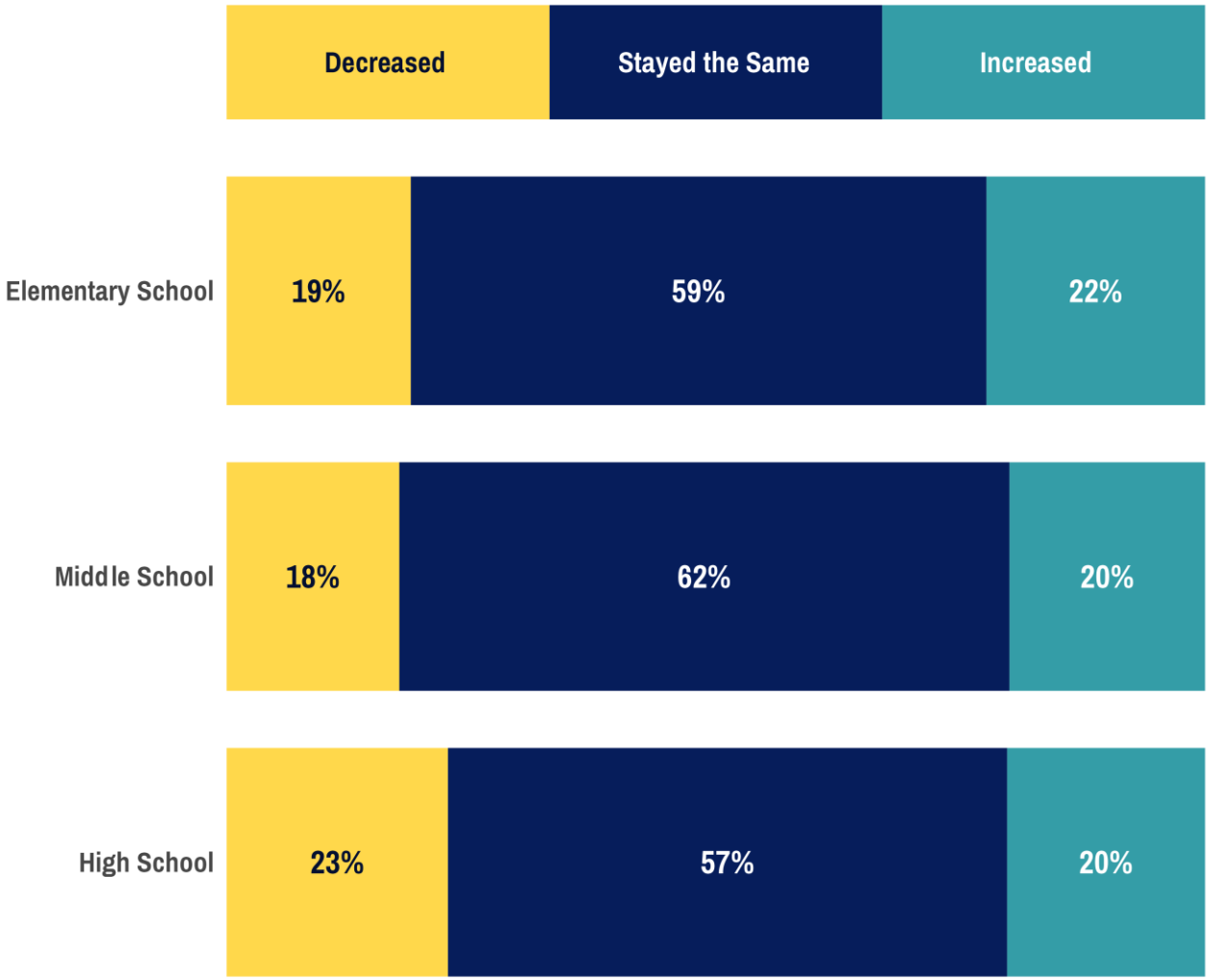
# MWEEs by Grade Band: Change Over Time



# Comparing Change in Paired 2019 and 2022 Data

### Comparing Changes in Preparedness within Paired 2019 and 2022 Data

Whether preparedness levels (prior page) increased, decreased, or stayed at the same levels, within individual LEAs in Virginia for which year-to-year data were available. (n=85)




**Exploring the subset of LEAs for which we have year-to-year data, we see most districts stayed at the same level from 2019.**

Among LEAs in Virginia for which we are able to compare 2019 and 2022 data, there was a relatively balanced picture of shifts. While most stayed at the same level in the past three years, about an equal proportion moved to a higher level as those who moved to a lower level, across all three grade bands.

# High School: Required Courses Using MWEEs

**Of the 67 LEAs that reported having at least some MWEE experiences within required high school course(s), most tended to be within science courses.**

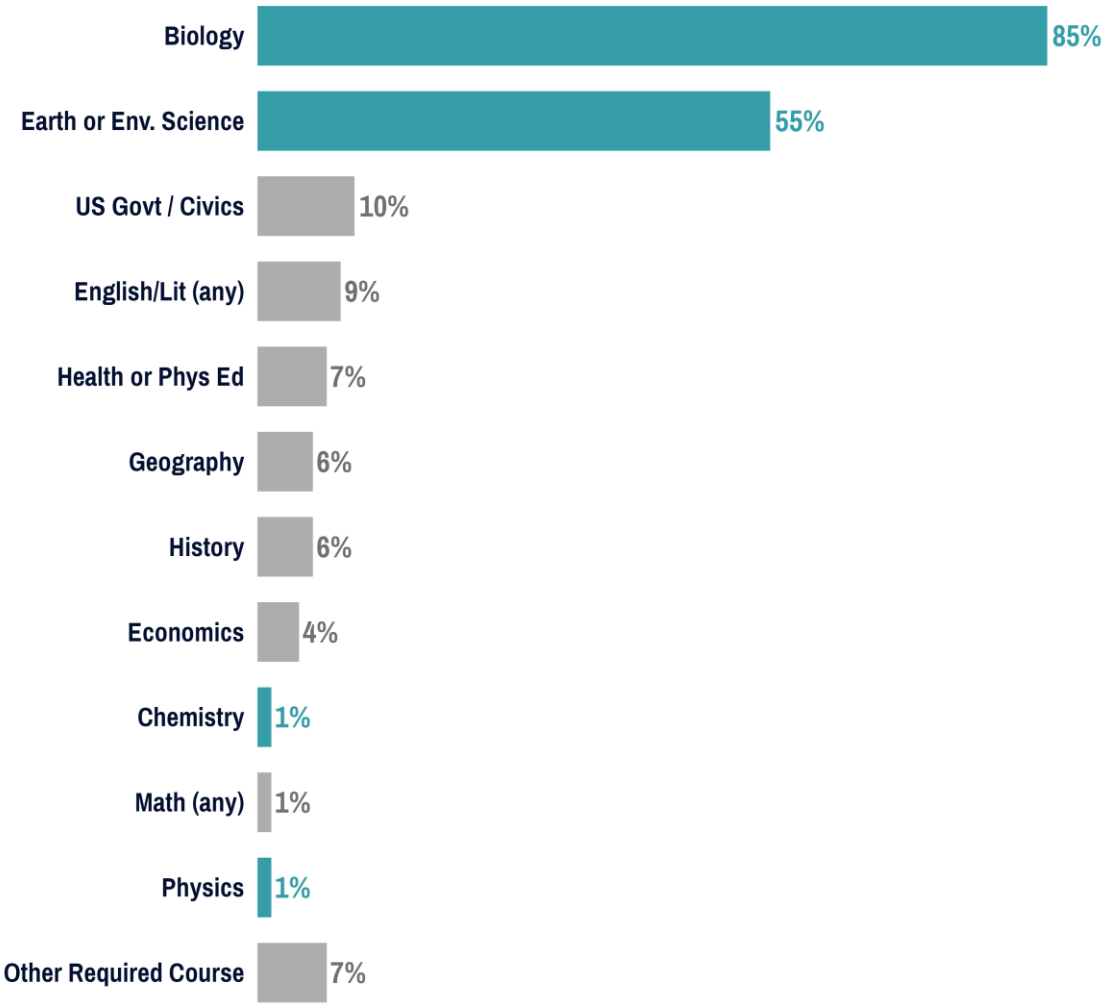
Biology was by far the most common required subject that incorporated MWEEs – whether in individual courses or system-wide. Environmental science was another common required course for MWEEs at the high school level.

Notably, rates of environmental science as a required MWEE went down in 2022 (currently 55%, from 75% in 2019). This is may be due to the reformulated survey questions about required and elective courses.

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

**Percentage of LEAs that Provide MWEEs within Each Required Subject (n=67)**

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



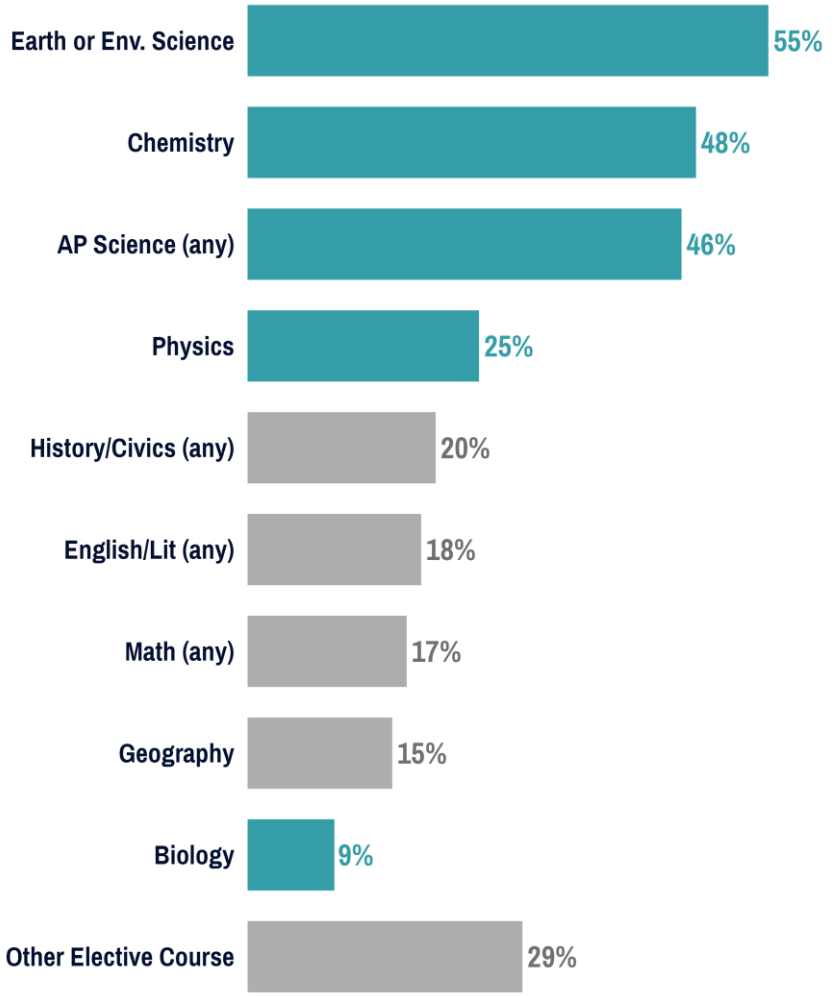
# High School: Elective Courses Using MWEEs

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

The top 4 most common elective subjects that included a MWEE were all science courses. Other non-science elective courses included English, mathematics, geography, and history. 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.

**Percentage of LEAs that Provide MWEEs within Each Elective Subject (n=65)**

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, professional development to facilitate outdoor field experiences was rated as the greatest need, on average, but only by a very small margin.**

Notably, most of the items focused on supporting teacher professional development (PD) were rated as the most highly needed across LEAs, with additional priority placed on 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.

Four respondents wrote in "other needs" (some rated "other needs" without naming the need):

> *"additional staff dedicated to MWEEs" (7)*
>
> *"state to place importance on it." (7)*
>
> *"Support for teacher/Instructional Facilitators (FTE)." (7)*
>
> *"We would like to utilize environmental learning progressions from K-12 to implement sound environmental instruction throughout our curricula." (7)*

Note: the items asked were revised for the 2022 ELIT survey; as a result, there is no year-to-year comparison possible.

**Average Ratings of Need for Support in Each Area Statewide (n=92)**

Responding LEAs rated their level of need for support in each area from 1 to 7, with 7 being the greatest need.

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