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American Mathematics Educator Study

2026 Technical Documentation and Survey Results

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About This Report

This technical report provides detailed information about the sample, survey instruments, and resultant data for the 2026 American Mathematics Educator Study (AMES) surveys that RAND administered to principals and teachers in spring 2026 via the RAND Corporation's American Educator Panels (AEP).

The 2026 AMES surveys investigate students' access to high-quality mathematics learning opportunities from elementary school through college and career pathways in high school, and the obstacles that stand in the way of providing these opportunities to all students and, particularly, Black, Hispanic, and low-income students. The results are intended to inform policy and education practice related to mathematics education. If you are interested in using AEP data for your own analysis or reading other AEP-related publications, please visit www.rand.org/education-and-labor/projects/aep.html or email aep@rand.org.

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This document contains recycled text from previous AEP technical documentation in regard to AEP methods.

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American Mathematics Educator Study: 2026 Technical Documentation and Survey Results

This technical report provides detailed information about the sample, survey instruments, and resultant data for the 2026 American Mathematics Educator Study (AMES) surveys, which RAND administered in spring 2026 to a sample of teachers and school leaders within RAND's American Educator Panels (AEP). RAND first administered the AMES surveys in 2023 and will administer them again each spring through 2027. The AMES investigates students' access to high-quality mathematics learning opportunities from elementary school through college and career pathways in high school and the obstacles that stand in the way of providing these opportunities to all students (and, particularly, Black, Hispanic, and lower-income students).

The AEP consist of the American Teacher Panel (ATP), the American School Leader Panel (ASLP), and the American School District Panel (ASDP). These panels are nationally representative samples of K–12 public school educators and leaders. The ATP includes more than 30,000 teachers, the ASLP includes more than 8,000 school principals, and the ASDP includes more than 1,000 district leaders (i.e., superintendents). Panelists respond to numerous online survey requests each year. The AEP began in 2014 and expanded significantly during the 2016–2017 and 2017–2018 school years (Robbins and Grant, 2020).

Since 2014, RAND has recruited AEP members using probabilistic sampling methods. RAND designed the AEP samples are designed to be large enough to support national analyses and analyses of prevalent subgroups at the national level (e.g., elementary school teachers, high school mathematics teachers, teachers in urban schools). Similarly, RAND designed the ATP is designed to permit state-representative analyses of teacher responses in more than 25 states and the District of Columbia. All AEP surveys are conducted online and in English.

The 2026 American Mathematics Educator Study Survey

Results from the most recent National Assessment of Educational Progress (NAEP) and other research are clear: U.S. students lost more learning in mathematics and other subjects over the past few years than has ever before been measured, and their achievement has not recovered post-COVID. NAEP 2022 mathematics scores for students in grades 4 and 8 reflected record declines, with the largest decreases among students experiencing poverty and students of color. NAEP 2024 mathematics scores recovered slightly but are still lower than pre-pandemic (Nation's Report Card: Mathematics, undated).

The COVID-19 pandemic is just the most recent force widening mathematics achievement gaps. Other obstacles to high-quality mathematics learning for all students—and particularly for Black, Hispanic, and lower-income students—include inequitable access to and participation in

rigorous mathematics courses (Wolfe, Steiner, and Schweig, 2023; Walston and Carlivati McCarroll, 2010; Gamoran and Hannigan, 2000), tracking of students in classes based on their achievement level (Gamoran et al., 1997; Kaufman et al., 2012; Oakes et al., 1990; Schmidt, 2009), and inadequate mathematics instructional materials and supports for teachers (Cogan, Schmidt, and Wiley, 2001; Doan, Kaufman, et al., 2022; Short and Hirsh, 2020).

However, critical gaps remain in what we know about how to ensure high-quality, equitable mathematics learning for all students. In response, RAND researchers have administered the AMES surveys annually each spring to a sample of ATP and ASLP members who work in K–12 public schools, starting in 2023 and continuing through 2027. Findings across these surveys are intended to provide insights on critical factors that might influence teachers' mathematics instruction and students' mathematics learning experiences, from mathematics courses and curriculum materials to teachers' preparation and professional learning resources, among many other topics described in more detail in Table 1. This technical document covers the spring 2026 survey. The technical documents for the spring 2023 survey (Schweig et al., 2023), the spring 2024 survey (Schweig et al., 2024), and the spring 2025 survey (Schweig et al., 2025) are available on the AMES website (RAND Corporation, undated), along with all RAND reports and webinars based on AMES data.

As in 2023, 2024, and 2025, the AMES 2026 ATP sample targeted K–12 public school teachers who reported teaching mathematics. Geographically, the sample was designed to produce 400 completed surveys in each of four states (California, Florida, New York, and Texas) and 1,500 completed surveys among all other states for a total of 3,100 surveys (see the "Survey Completion Results" section for details about completion rates). These sampling targets were selected to balance estimate precision, available sample, and ATP recruitment costs.

As in 2023, 2024, and 2025, the AMES 2026 ASLP sample targeted principals serving in public schools at all K–12 grade levels, with oversamples of principals in the same four states as those oversampled for the ATP: California, Florida, New York and Texas. In addition, ASLP captured oversamples of high school principals in two states: Texas and Washington. We focused specifically on Texas and Washington to track investments by the survey sponsor in these states. Geographically, the sample was designed to produce 400 completed surveys each from K–12 public school principals in California, Florida, New York, and Texas; an additional 100 completed surveys from high school principals in Texas; and 100 completed surveys from high school principals in Washington, along with 1,500 completed surveys across all other states for a total of 3,300 surveys (see "Survey Completion Results" section for details about completion rates). The additional high school principals surveyed in Texas and Washington were included specifically to improve the precision of estimates from the postsecondary pathways section of AMES. Survey eligibility was limited to current school leaders.

Annexes to this report, with the full descriptive results for the 2026 school leader survey and 2026 teacher survey, are available at www.rand.org/t/RRA4411-6.

Survey Administration and Content

We developed the AMES surveys in consultation with funders (see the "About This Report" section earlier in this report) and a variety of experts on mathematics education. Experts and funders provided feedback on question wording, format, and sequencing, with RAND maintaining final editorial control of the survey items. We designed the surveys to generate nationally representative data on K–12 teacher and principal perspectives regarding the topics listed in Table 1, in addition to state-representative data for teachers and principals in select states. Many survey items were developed by RAND, but the surveys also borrowed items (with permission) from several other sources. Our annexes to this report include notes on items taken from or adapted from non-RAND sources[1]. In addition, items were borrowed or adapted from prior RAND surveys (Steiner, Hamilton, et al., 2020; Steiner, Kaufman, et al., 2020; Doan, Eagen, et al., 2022; Doan, Zuo, et al., 2022; Young et al., 2021).

Researchers and state education agencies in the four states with teacher and principal oversamples are the intended users of the survey data. State education agencies in these four states can compare the responses of teachers and principals from their states with a nationally representative comparison group.

The AMES ATP survey had an approximate administration time of 15 minutes. Respondents were assigned to sections based on their responses to questions at the beginning of the survey about their grade band (K–5, 6–8, or 9–12). To ensure an adequate number of 6–8 grade teachers in the AMES ATP sample, if a respondent indicated teaching any grade 6–8, they were assigned the 6–8 grade path. If a respondent indicated teaching any grade K–5 and 9–12, but not 6–8, they were randomly assigned to either the K–5 or 9–12 grade path[2].

The AMES ASLP survey had an approximate administration time of 15 minutes (with an additional five minutes for administering the College and Career Pathways questions to principals leading schools serving grades 6–12). Similar to the ATP survey, AMES ASLP sample members were assigned to the grade 6–8 path if they indicated leading a school serving any grade 6–8 and were randomly assigned to the K–5 or 9–12 grade path if they indicated leading a school serving any grade K–5 and 9–12 but not 6–8[3].

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[1] Non-RAND sources were National Center for Education Statistics (NCES), 2009; Impact Research, 2023; and Columbia University Center for Public Research and Leadership (2025).

[2] Respondents were assigned sections to reduce overall survey burden. In total, there were 61 teachers who indicated teaching K–5 and 6–8 who were assigned to the 6–8 grade path; 49 teachers who indicated teaching 6–8 and 9–12 who were assigned to the 6–8 grade path; 11 teachers who indicated teaching K–5, 6–8, and 9–12 who were assigned to the 6–8 grade path.

[3] Respondents were assigned sections to reduce overall survey burden. In total, there were 536 principals who indicated working in schools that served grades K–5 and 6–8 who were assigned to the 6–8 path; 156 principals who indicated working in schools that served grades 6–8 and 9–12 who were assigned to the 6–8 path; and 83 principals who indicated working in schools that served grades K–5, 6–8, and 9–12 who were assigned to the 6–8 path.

Table 1 presents a summary of the content areas that were included in each survey.

Table 1. AMES American Teacher Panel and American School Leader Panel Survey Content Areas

Content Area	Asked in ATP	Asked in ASLP
School and teaching context and coursetaking	X	X
Instruction and instructional planning	X	
Instructional resources	X	X
Use of Artificial Intelligence Tools	X	X
Professional learning	X	X
Teacher preparation	X	
District/school leadership and school culture and norms	X	X
Student access and opportunity		X
College and career pathways		X (middle and high school principals only)
Principal/teacher background	X	X

Survey Completion Results

American School Leader Panel

The 2026 AMES yielded 2,406 completed or partial responses from a sample of 7,370 ASLP members, with 73 panelists screened out because they did not meet eligibility requirements. After review, 2,166 of these cases (2,062 full completes and 104 partial) were weighted as part of the final data file[4]. After removing screened cases from the 7,370 invitations for school leaders, the final completion rate, following conventions defined by the American Association for Public Opinion Research (2016), was 29.7 percent.

Supplemental Principal Sample

Our panels did not have adequate sample to produce the target number of completed principal surveys in the oversample states. To avoid exhausting the supply of principals in these states over the course of this five-year project, we drew a supplemental principal sample to increase the number of completed principal surveys. We drew the supplemental sample using several vendors and applied the same eligibility criteria as for principals invited to join the ASLP (public K–12 school principals leading 'regular' schools, as defined by NCES [1999, p. 350]). The supplemental sample was limited to the five principal oversample states and was deduplicated to ensure that current ASLP members were not invited, nor were principals who were recruited to join the panels in the past two school years. The supplemental sample included

[4] Weighting procedures are described in detail in the "Calibrated Weighting" section below.

6,561 principals. The supplemental sample generated 1,535 fully completed or partially completed AMES surveys, with 32 invitees screened out because they did not meet eligibility requirements. Of these cases, 1,256 (1,100 full completes and 156 partial) received a weight and were included in the data file. The response rate for the supplemental sample was 19.2 percent. Across the ASLP and Supplemental Principal samples, the total AMES sample size was 3,422 school leaders. Table 2 provides weighted descriptive statistics for the 3,422 AMES School Leader survey respondents. The weights, described below, are intended to ensure that the sample reflects the national population of school leaders.

Table 2. Descriptive Statistics for AMES School Leader Respondents

Variable	Unweighted [CI]	Weighted [CI]	Population
School level			
Elementary	50.7 [49.0, 52.3]	59.1 [57.2, 61.0]	59.2
Middle	21.4 [20.0, 22.8]	17.8 [16.4, 19.3]	17.8
High	27.9 [26.4, 29.4]	23.0 [21.4, 24.7]	23.0
School neighborhood poverty			
Low poverty (IPR 401 to 999)	26.2 [24.7, 27.6]	23.2 [21.6, 24.9]	23.3
Middle poverty (IPR 201 to 400)	57.0 [55.4, 58.7]	58.4 [56.5, 60.4]	58.4
High poverty (IPR 0 to 200)	16.8 [15.6, 18.1]	18.3 [16.7, 19.9]	18.3
School student race/ethnicity			
Majority white	48.2 [46.5, 49.8]	50.9 [48.9, 52.8]	50.8
Majority students of color	51.8 [50.2, 53.5]	49.1 [47.2, 51.1]	49.2
School size			
Small (449 students or fewer)	44.1 [42.5, 45.8]	51.5 [49.5, 53.5]	51.5
Large (450 students or greater)	55.9 [54.2, 57.5]	48.5 [46.5, 50.5]	48.5
School locale			
Urban	27.3 [25.8, 28.8]	27.8 [26.0, 29.5]	27.8
Suburban	35.1 [33.5, 36.7]	30.8 [29.0, 32.6]	30.9
Town/Rural	37.6 [36.0, 39.2]	41.4 [39.4, 43.4]	41.3
Principal gender			
Female	54.9 [53.2, 56.5]	55.8 [53.9, 57.8]	55.9
Male	45.1 [43.5, 46.8]	44.2 [42.2, 46.1]	44.1
Principal race/ethnicity			
White	73.9 [72.5, 75.4]	78.2 [76.7, 79.8]	78.2
Other	26.1 [24.6, 27.5]	21.8 [20.2, 23.3]	21.8
Principal highest degree			
Master’s or less	53.4 [51.7, 55.1]	63.6 [61.8, 65.4]	63.7
Greater than master’s	46.6 [44.9, 48.3]	36.4 [34.6, 38.2]	36.3

NOTE: N=3,422 survey respondents; CI=95% Confidence Interval; IPR=income-to-poverty ratio; Population totals are from NCES's 2020–21 National Teacher and Principal Survey and 2023–24 Common Core of Data. School neighborhood poverty data were obtained from the 2021–22 EDGE School Neighborhood Poverty Estimates.

American Teacher Panel

The 2026 AMES yielded 3,568 completed or partial responses from a sample of 7,439 ATP members, with 280 panelists screened out because they did not meet eligibility requirements (no longer a math teacher, switched to a private school, retired, etc.).[5] After review, 3,091 of these cases (3,057 full completes and 34 partial) received a weight. After removing screened cases from the 7,439 invitations for teachers, the final completion rate, following conventions defined by the American Association for Public Opinion Research, was 43.2 percent. Table 3 provides weighted descriptive statistics for the 3,091 AMES ATP survey respondents. The weights, described below, are intended to ensure the sample reflects the national population of math teachers.

Table 3. Descriptive Statistics for AMES Teacher Respondents

Variable	Unweighted [CI]	Weighted [CI]	Population
School level			
Elementary	61.2 [59.5, 62.9]	65.3 [63.4, 67.3]	65.3
Middle	18.3 [16.9, 19.7]	16.4 [14.9, 17.9]	16.4
High	20.5 [19.1, 21.9]	18.2 [16.7, 19.8]	18.3
School neighborhood poverty			
Low poverty (IPR 401 to 999)	30.5 [28.9, 32.2]	29.6 [27.7, 31.5]	29.6
Middle poverty (IPR 201 to 400)	54.7 [53.0, 56.5]	54.2 [52.1, 56.3]	54.0
High poverty (IPR 0 to 200)	14.8 [13.5, 16.0]	16.3 [14.7, 17.9]	16.4
School student race/ethnicity			
Majority white	43.7 [41.9, 45.4]	45.9 [43.8, 48.0]	45.8
Majority students of color	56.3 [54.6, 58.1]	54.1 [52.0, 56.2]	54.2
School size			
Small (449 students or fewer)	30.9 [29.3, 32.6]	33.1 [31.2, 35.1]	33.1
Large (450 students or greater)	69.1 [67.4, 70.7]	66.9 [64.9, 68.8]	66.9
School locale			
Urban	31.3 [29.6, 32.9]	30.0 [28.1, 31.9]	30.1
Suburban	41.2 [39.4, 42.9]	38.8 [36.8, 40.8]	38.7
Town/Rural	27.6 [26.0, 29.2]	31.2 [29.2, 33.2]	31.2
Teacher gender			
Female	81.8 [80.4, 83.1]	81.3 [79.7, 83.0]	81.2
Male	18.2 [16.9, 19.6]	18.7 [17.0, 20.3]	18.8
Teacher race/ethnicity			
Black	6.2 [5.3, 7.0]	6.8 [5.7, 7.9]	6.8
Hispanic	11.0 [9.9, 12.1]	9.6 [8.4, 10.8]	9.7
White	77.1 [75.6, 78.6]	80.2 [78.5, 81.8]	80.1
Other	5.7 [4.8, 6.5]	3.4 [2.7, 4.1]	3.4
Teacher years of experience			
0 to 9 years	18.4 [17.0, 19.8]	36.3 [34.1, 38.6]	36.6
10+ years	81.6 [80.2, 83.0]	63.7 [61.4, 65.9]	63.4

NOTE: N=3,091 survey respondents; CI=95% Confidence Interval; IPR=income-to-poverty ratio; Population totals are from NCES's 2020–21 National Teacher and Principal Survey and 2023–24 Common Core of Data. School neighborhood poverty data were obtained from the 2021–22 EDGE School Neighborhood Poverty Estimates.

[5] Teachers could not screen into the survey (e.g., teachers initially classified as fine arts teachers who had switched to mathematics during the time of survey administration), because these teachers would not have been invited to complete the survey on the basis of their initial classification. As a result, some level of undercoverage might exist, with eligible teachers misclassified as out of scope.

Calibrated Weighting

The 2026 AMES data files include weights to produce estimates that reflect the national population of public-school teachers and principals in the United States and state-specific populations in four oversampled states during the 2025-2026 school year. The weighting process accounts for the probability of selection into the survey from the panel and the likelihood that an invited teacher or principal will complete the survey. We calibrated likelihoods to reproduce the population distribution of K–12 teachers and principals, with state-specific calibrations performed in oversampled states. The nonresponse adjustment eliminates known sources of bias and ensures that the weighted sample matches the national characteristics of educators at the individual and school levels. This weighting approach is widely used for probability sample surveys and to adjust for nonresponse, including for such U.S. Department of Education surveys as the Teacher Follow-Up Survey. The final analysis weights are the product of the following three interim weights:

1. **The calibrated weight of the ATP/ASLP sampling frame**. This is a calibration weight that assigns a weight for each ATP/ASLP member based on individual and school-level characteristics so that the sum of the weights along the calibration factors closely matches the characteristics of the national population of teachers and principals based on the Schools and Staffing Survey and the CCD, which are both from the National Center for Education Statistics (NCES), as well as the state-specific population of teachers and principals in oversampled states[6]. (See Robbins and Grant, 2020, for more information.)
2. **The sample selection weight**. This is the inverse probability of selection into the 2026 AMES sample using the ATP/ASLP as the frame. These probabilities were selected to achieve the goals of 3,100 ATP and 3,300 ASLP completed surveys. These weights are used to account for the differential probability that respondents are invited and enrolled in the ATP/ASLP.
3. **The survey response weight**. This is the inverse of the modeled probability of a teacher or principal completing the survey. These weights are used to account for the differential probability that respondents complete the 2026 AMES, conditional upon being invited to complete the 2026 AMES.

We subsequently recalibrated and trimmed the products of these weights as necessary. Recalibration ensures that the weights recover the population estimates after selection and nonresponse adjustments are applied. We designed the sampling and weighting approach to ensure a representative sample and limit the size of the design effect. We calculated the sampling frame weights to make the panel match the national population of teachers and principals based on several school-level (e.g., school size, level, urbanicity) and individual-level (e.g., gender,

[6] For the ASLP, calibration weights are based on characteristics reported in Table 2, including: School Level, School Income-to-Poverty Ratio, Student Race/Ethnicity Composition, School Size, School Locale, Principal Gender, Race, and Education. For the ATP, calibration weights are based on characteristics reported in Table 3, including: , School Level, School Income-to-Poverty Ratio, Student Race/Ethnicity Composition, School Size, School Locale, Teacher Gender, Race, and Years of Experience.

experience) characteristics. We used the inverse of the selection probabilities (p_{si}) as the sample selection weight. We estimated the response weights by modeling the likelihood (p_{ri}) that a selected participant would respond to the survey, conditional on the school-level and individual-level characteristics of teachers and principals (including the states in which they are working). For parsimony, we used a variable-selection method to choose the model that best fit the data[7]. We estimated the main weight as the product of the sampling frame calibration weight ($1/p_{fi}$), the sample selection weight ($1/p_{si}$), and the response weight ($1/p_{ri}$), as follows:

$$Main\ Weight = {}^{1}/_{p_{fi}} \times {}^{1}/_{p_{si}} \times {}^{1}/_{p_{ri}}$$

Because the main weight does not necessarily sum to the total of all population characteristics, we calibrated it again based on individual and school-level characteristics, to obtain the final weight. Where some of these final weights were extreme within sampling states, we applied a trimming process (at the 95th percentile) to reduce the outliers, and reallocated the trimmed weights so that population totals remain the same after trimming.[8]

The survey weights included in the 2026 AMES are intended to support cross-sectional (e.g., current-year) analysis of teacher and school leader survey responses. Cross-sectional comparisons of estimates across the AMES surveys that we intend to administer in 2027 will be useful for observing shifts in national, descriptive trends, but we did not design these weights to support longitudinal analyses among the same teachers over time (i.e., they do not account for panel members who do and do not complete the AMES in multiple years versus those who do not).

[7] Non-response models employ logistic regression to infer response probabilities. The same variables used for the calibration weights are used in the initial specification of the non-response model. In order to avoid overfitting, we sequentially run models using all possible combinations of covariates and then use information criteria (specifically AIC and BIC) to appraise model fit. Ultimately, we use the most parsimonious model with the lowest AIC for non-response probability prediction.

[8] Replicate weights were not produced for the AMES data files; variance estimation using the provided single weight should suffice. We made this decision after calculating variance with and without replication, and determined that differences in the standard errors were negligible. If analysts of these data need to estimate variance using replication, syntax for an alternative variance estimation method (jackknife) is available upon request.

Abbreviations

AEP	American Educator Panels
AMES	American Mathematics Educator Study
ASLP	American School Leader Panel
ATP	American Teacher Panel
CCD	Common Core of Data
ELD	English Language Development
EL	English Learner
IEP	Individualized Education Program
NAEP	National Assessment of Educational Progress
NCES	National Center for Education Statistics

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