Student Math Perceptions Survey
American Institutes for Research
Last updated 3.4.26

Student Math Perceptions Survey

This measure assesses students' self-reported perceptions about themselves as math learners.

Purpose

- The Student Math Perceptions Survey was developed to measure the effectiveness of interventions in changing students' perceptions of themselves as math learners. The survey can also be used to investigate the relationships between these perceptions and other learning outcomes or experiential constructs, providing insight into the mechanisms underpinning math learning.
- The constructs captured within the Student Math Perceptions Survey are:
    - Math Anxiety: one's feelings of anxiety and associated emotions related to doing mathematics
    - Math Self-Efficacy: one's belief in their ability to succeed at math learning tasks or activities
    - Math Confidence: one's sense in their overall ability to be successful in math
    - Sense of Belonging in Math Class: one's feelings related to their comfort and "fit"within their math learning environment
    - Math Identity: one's perception of how others see their mathematical capabilities, in addition to their own perception of themselves as a math learner

Measure Details

- The final version of the Student Math Perceptions Survey has 18 items across five subscales:
    - Math Anxiety: 3 items
    - Math Self-Efficacy: 4 items
    - Math Confidence: 4 items
    - Sense of Belonging in Math Class: 4 items
    - Math Identity: 3 items
- All items are administered on a 5 point Likert scale, from "Strongly Disagree" to "Strongly Agree." The items were scored with "Strongly Disagree" = 0 and "Strongly Agree" = 5. We suggest creating an average score across all items in each subscale for analyses and reporting.

Development History and Previous Uses

- The Student Math Perceptions Survey was developed by identifying and adapting existing items and scales from the field which had been administered to and/or validated with students in grades 3-8, including those who identify as Black, Hispanic, or students experiencing poverty (e.g. Fast, et al., 2010; Fennema & Sherman, 1976; Fleshman, 2012; and Lewis, et al., 2012) . These adaptations ensured grade-appropriate language and positively worded items were being used across the survey. Where

necessary, additional items were constructed to account for related facets of each construct. Items were reviewed and adjusted in partnership with multiple interdisciplinary R&D project teams to ensure they were aligned with EF+Math's mission and the R&D teams' individual project foci for supporting student learning.

- An initial version of the Survey was administered within two independent evaluation studies of supplemental math programs (CueThinkEF+, a problem solving platform for middle grades students, and Fraction Ball, a unit of lessons focused on rational number knowledge for elementary students). After analysis of data from these studies, additional rounds of revision were conducted to adjust items for several subscales. In particular, the scales for Sense of Belonging and Math Identity were updated to use with newly validated items from the Gates Foundation Balance the Equation Algebra I Grand Challenge. These items offered higher scale reliability and established validity with the demographic samples for the EF+Math Program studies.
- The final version of the measure was administered as part of three more independent evaluation studies of supplemental math programs (CueThinkEF+, Fraction Ball, and MathFluency+, a fact fluency game-based platform for elementary students).
- Across all five independent evaluation studies this measure has been used with a demographically diverse sample of more than 12,000 students in grades 4-8, with a majority of the participating students identifying as Black and Hispanic or as experiencing poverty.

Contribution to the Field

- This measure was developed due to the limited availability of measures of students' math-related perceptions which consist of the combination of factors identified above. Student perceptions of their math learning are multi-faceted, and existing measures may provide insight to particular components; however, you may need to administer multiple of other existing measures in order to gain insight into the constructs of interest of perceptions outlined in this measure.
- The Student Math Perceptions Survey was also created to be used alongside other outcome measures of student learning and experience; for this reason, the subscales were kept as succinct as possible, adequately capturing multi-faceted construct dimensions while maintaining separation across items.

Accessing the Measure

- To access the measure, please contact:
    - Dr. Tiffini Pruitt-Britton at tpruitt-britton@air.org and
    - Dr. Toni Smith at tsmith@air.org

Student Math Perceptions Survey
American Institutes for Research
Last updated 3.4.26

Associated Publications

Smith, T., Williams, R., Cade, W., Joshi, M., Meyer, C., Dedrick, D., Margolin, J., Zhu, B., & Pruitt-Britton, T. (2025, August). CueThinkEF+ phase 4 evaluation: Final report. American Institutes for Research. 10.17605/OSF.IO/Y2WR5

Smith, T., Williams, R., Eisner, R., Dedrick, D., Meyer, C., Chattoraj, T., Zhu, B., & Pruitt-Britton, T. (2026, February). MathFluency+ Phase 5 Evaluation: Final Report. American Institutes for Research. 10.17605/OSF.IO/WEUFG

Smith, T., Williams, R., Rich, K., Park, S., Meyer, C., Margolin, J., Zhu, B, & Pruitt-Britton, T. (2025, August). Fraction Ball phase 4 evaluation: Final report. American Institutes for Research. 10.17605/OSF.IO/FVJ5Q

Smith, T., Williams, R., Rich, K., Oh, D., Meyer, C., Chattoraj, T., Zhu, B., & Pruitt-Britton, T. (2026, February). Fraction Ball phase 5 evaluation: Final report. American Institutes for Research. 10.17605/OSF.IO/NAJD6