

Appendix C
Teacher Survey

Efficacy Study of the Toolkit to Support Evidence-Based Algebra Instruction in Middle and High School

Teacher Survey

Fall 2024 & Spring 2025

Thank you for taking the time to complete this survey as part of a study about algebra instruction in [SCHOOL DISTRICT]. Through this survey, we want to learn about your background and experience; the types of professional development supports offered by your school district; your beliefs about your teaching abilities; your algebraic content knowledge; and your algebra instructional practices.

[**ADDITIONAL WORDING TREATMENT ONLY SPRING 2025**: We also want to hear your thoughts on your current and sustained use of the Toolkit's recommended practices].

- The survey should take about 20 minutes to complete.
- If you are unsure how to answer a question, please give the best answer you can rather than leaving it blank.
- **The information from this survey will be used for research purposes only, and you won't be identified in any way.** All data collected for this study will be kept confidential, except as required by law. The researchers conducting this study follow the confidentiality and data protection requirements of the U.S. Department of Education's Institute of Education Sciences (The Education Sciences Reform Act of 2002, Title I, Part E, Section 183). We will not provide information that identifies you, your school, or your district to anyone outside the study team, except as required by law.
- **This survey is voluntary.** There are no risks or benefits to participating. You may skip any questions you do not wish to answer; however, we hope that you answer as many questions as you can.
- This study has received Institutional Review Board approval from Health Media Lab, and your school district has also approved this study. If you have any questions about this study or your rights as a research volunteer, you can contact the study team at [EMAIL ADDRESS].

q **START THE SURVEY**

I. Professional development [Spring 2025 only]

Please answer the following questions about the professional development you've received so far during the 2024-2025 school year.

[ALL]

I.1. Please estimate the total number of hours of the following types of professional development and supports that you received from summer 2024 through the 2024-2025 school year to today. Indicate the total number of hours for each type or enter "0" if you did not receive professional development in an area. Your best estimate is fine.

(Source: adapted from IES [Oklahoma Teacher Professional Development Survey](#); and Impact Evaluation of Support for Principals)

Type of support	Total Hours Received [numerical responses only]
I.1a. Participated in formal degree program or university courses (online or in person) or other formal group learning sessions, such as workshops, conferences, or seminars	
I.1b. Participated in a professional learning group with other teachers in the school or district (<i>new item</i>)	
I.1c. Observed a demonstration of teaching (videos or modeled by presenters)	
I.1d. Observed by a peer, coach, or administrator for the purpose of improving instructional practices, including receiving any associated feedback (<i>new item</i>)	
I.1e. Received guidance in planning instruction or assessing student progress from a peer, coach, or administrator (outside of classroom observations)	
I.1f. Received opportunities to practice using new instructional materials or techniques in the classroom	
I.1g. Received opportunities to independently review published educational research, curricular or instructional materials, or school or student information (<i>new item</i>)	
I.1h. Other (<i>please describe</i>)	

q Between the start of the 2024-2025 school year and today, I did not receive any of the above professional development and supports

[ALL]

[HOVER TEXT FOR **PROFESSIONAL DEVELOPMENT ACTIVITIES**: Professional development activities could include, but are not limited to, university courses, workshops, conferences, seminars, professional learning groups, classroom observations, and meetings with a mentor or coach.]

[HOVER TEXT FOR **ALGEBRA CONTENT**: Algebra content: professional development activities designed to increase teachers' own understanding of algebra concepts.]

[HOVER TEXT FOR **GENERAL ALGEBRA PEDAGOGY/INSTRUCTION**: General algebra pedagogy/instruction: Professional development activities designed to support teachers' general practices for teaching algebra that may apply across different curricula or topics.]

[HOVER TEXT FOR **ALGEBRA CURRICULUM**: Algebra curriculum: professional development activities designed to support the use of a particular curriculum or set of structured activities for teaching algebra.]

[HOVER TEXT FOR **INTEGRATING INFORMATION TECHNOLOGY INTO ALGEBRA**: Integrating information technology into algebra: professional development activities designed to support the use of hardware (such as computers or iPads) and software (such as online applications, games or tools) to enhance algebra instruction in the classroom.]

[HOVER TEXT FOR **IMPROVING STUDENTS' CRITICAL THINKING OR PROBLEM-SOLVING SKILLS**: Professional development activities designed to support teaching practices specifically related to students' ability to think critically or solve new kinds of problems.]

[HOVER TEXT FOR **ALGEBRA ASSESSMENT**: Algebra assessment: professional development activities designed to support teachers' use of algebra assessments in the classroom.]

I.2. From summer 2024 through the 2024-2025 school year to today, have you participated in any professional development activities that covered any of the following topics? For each topic you select "yes" for, please estimate the total number of hours of professional development you received. Mark one for each item (Source: adapted from TIMSS 2015 Teacher Mathematics Questionnaire 8th grade)

	Yes	No	(If yes) Number of hours [numerical responses only]
a. Algebra content	1 m	0 m	
b. General algebra pedagogy/instruction	1 m	0 m	
c. Algebra curriculum	1 m	0 m	
d. Integrating information technology into algebra	1 m	0 m	
e. Improving students' critical thinking or problem-solving skills	1 m	0 m	
f. Algebra assessment	1 m	0 m	

II. Your beliefs in your mathematics instructional skills [Fall 2024 & Spring 2025]

Please answer the following questions about your beliefs in your mathematics instructional skills.

[ALL]

Please indicate your opinion about each of the statements below. Mark one for each item
(Sources: Self-Efficacy for Teaching Mathematics Instrument (SETMI), Part I; and select items from the Teachers' Sense of Efficacy Scale, Efficacy in Instructional Strategies subscale).

	Not at All	Very Little	Some Degree	Quite a Bit	A Great Deal
II.1. To what extent can you motivate students who show low interest in math?	0 m	1 m	2 m	3 m	4 m
II.2. To what extent can you help your students value learning math?	0 m	1 m	2 m	3 m	4 m
II.3. To what extent can you craft relevant questions for your students related to math?	0 m	1 m	2 m	3 m	4 m
II.4. To what extent can you get your students to believe they can do well in math?	0 m	1 m	2 m	3 m	4 m
II.5. To what extent can you use a variety of assessment strategies in math?	0 m	1 m	2 m	3 m	4 m
II.6. To what extent can you provide an alternative explanation or an example in math when students are confused?	0 m	1 m	2 m	3 m	4 m
II.7. To what extent can you implement alternative teaching strategies for math in your classroom?	0 m	1 m	2 m	3 m	4 m
II.8. To what extent can you respond to difficult questions from your students in your math class?	0 m	1 m	2 m	3 m	4 m
II.9. To what extent can you gauge student comprehension of what you have taught in your math class?	0 m	1 m	2 m	3 m	4 m
II.10. To what extent can you adjust your lessons to the proper level for individual students in your math class?	0 m	1 m	2 m	3 m	4 m
II.11. To what extent can you provide appropriate challenges for very capable students in your math class?	0 m	1 m	2 m	3 m	4 m

III. Pedagogical content knowledge [Fall 2024 & Spring 2025]

[ALL]

Please read the following statements about **algebraic content knowledge**. Please mark *true* or *false* for each statement. (Source: new items informed by [Star et al. \(2015\)](#))

	False	True
III.1. The most effective time in a given lesson to use solved problems is at the end of a given lesson.	0 m	1 m
III.2. When creating opportunities for students to analyze solved problems, it is always better to provide students with the questions in writing prior to engaging students in a discussion.	0 m	1 m
III.3. When displaying multiple solved problems at the same time, it is generally better for the solved problems to be the same degree of difficulty.	0 m	1 m
III.4. When possible, avoid using incorrectly solved problems, as these tend to be confusing for students.	0 m	1 m
III.5. Incompletely solved problems, where students fill in the missing steps of solved problems, can be used as a substitute for some of the assigned independent practice or exercises, including homework.	0 m	1 m
III.6. It is not important for a student to use precise mathematical language when describing their strategy for solving a problem; imprecise and vague language may be better if the rest of the class understands what the student is talking about.	0 m	1 m
III.7. If students are having trouble saying and understanding a complex mathematical term, teachers should avoid using this term.	0 m	1 m
III.8. It is often helpful for students to ask themselves questions about a problem they are solving, to focus their attention on the problem's mathematical structure.	0 m	1 m
III.9. It is helpful to compare different representations of the same mathematical concept since it may be easier to see certain aspects of the concept in some representations as compared to	0 m	1 m

	False	True
other representations.		
III.10. If students can solve an algebra word problem without using a diagram, a teacher should not require students to create a diagram.	0 m	1 m
III.11. Of the many ways that math problems can be solved, some of the ways are more effective than others.	0 m	1 m
III.12. Showing students three or four different strategies for solving a problem, all at the same time, is generally an effective instructional practice.	0 m	1 m
III.13. Comparing two solved problems side by side can help students deepen their understanding of both strategies.	0 m	1 m
III.14. It is more useful to compare two solved problems that are very different from each other than two solved problems that are very similar to each other.	0 m	1 m
III.15. For students who are struggling in math, it is better not to introduce them to multiple strategies, as this will confuse them.	0 m	1 m

IV. Algebra teaching practices [Fall 2024 and Spring 2025]

Please read the following statements about algebra teaching practices. Please think back [Fall 2024: to a typical month during the 2023-2024 school year, Spring 2025: over the last month] and estimate how often you used these teaching practices in your algebra classroom during that time. Please mark if you never, rarely, sometimes, often, or very often used each algebra teaching practice.

(Source: all items are new items and were informed by [Star et al. \(2015\)](#))

[ALL]

	[Fall 2024: In a typical month during the 2023-2024 school year, Spring 2025: In the last month], I used this practice... Mark one only for each practice				
	Never	Rarely	Sometimes	Often	Very often
IV.1. I asked students to discuss a correctly solved problem so they could make connections between strategies and reasoning.	0 m	1 m	2 m	3 m	4 m
IV.2. I asked students to discuss an incorrectly solved problem and to understand its error.	0 m	1 m	2 m	3 m	4 m
IV.3. I asked students to complete a problem that had been partially solved.	0 m	1 m	2 m	3 m	4 m
IV.4. I asked students to compare the strategies used to solve at least two solved problems.	0 m	1 m	2 m	3 m	4 m
IV.5. I encouraged students to use more precise language to notice a math problem's structure.	0 m	1 m	2 m	3 m	4 m
IV.6. I displayed, provided, or modeled questions designed to help students notice a problem's structure	0 m	1 m	2 m	3 m	4 m
IV.7. I asked students to practice using verbal or written questions to help them reflect on solving algebra problems.	0 m	1 m	2 m	3 m	4 m
IV.8. I asked students to describe information available in an algebra problem using multiple representations (such as equation(s), graph, diagram, and word problem).	0 m	1 m	2 m	3 m	4 m
IV.9. I asked students to name multiple ways to solve an algebra problem.	0 m	1 m	2 m	3 m	4 m
IV.10. I asked students to generate two or more strategies for solving a problem.	0 m	1 m	2 m	3 m	4 m
IV.11. I asked students to verbally describe the reasoning behind their choice of strategies when solving problems.	0 m	1 m	2 m	3 m	4 m
IV.12. I asked students to compare and contrast two or more strategies for solving a particular algebra problem or a particular type of problem.	0 m	1 m	2 m	3 m	4 m

V. Sustaining recommendations [SPRING 2025 TREATMENT ONLY]

Please answer the following question about sustaining the use of the three Toolkit recommendations in your Algebra 1 classes

[TREATMENT ONLY]

V.1. Looking ahead to the 2025-2026 school year, how likely or unlikely are you to continue using each of the three recommendations in your Algebra 1 classes? Mark one for each recommendation – or check the box below if you do not plan to teach next school year.

(Source: new question informed by [Star et al. 2015](#))

	Very likely	Likely	Not likely	Very unlikely
V.1a. Using solved problems to engage students in analyzing algebraic reasoning and strategy.	1	2	3	4
V.1b. Teach students to utilize the structure of algebraic representations.	1	2	3	4
V.1c. Teach students to intentionally choose from alternative algebraic strategies when solving problems.	1	2	3	4

⁰q I do not plan to teach next school year.

VI. Teacher demographics [Fall 2024 only; Spring 2025 for new teachers only]

Please answer the following questions about your background and teaching experience.

[ALL]

VI.1. Excluding student teaching, how many years had you worked as a school teacher before the start of the 2024-25 school year? Mark one only

(Source: adapted from the [2022 Operational Background, Education, and Training Grade 8 Teacher Questionnaire Reading/Mathematics/Social Studies](#) and the [NCES Spring 2007 Teacher Background Questionnaire](#))

0. None
1. Less than 1 year
2. 1-2 years
3. 3-5 years
4. 6-10 years
5. 11-20 years
6. 21 or more years

[ALL]

VI.2. **Excluding student teaching, how many years had you taught mathematics before the start of the 2024-25 school year?** *Mark one only*

(Source: adapted from the [2022 Operational Background, Education, and Training Grade 8 Teacher Questionnaire Reading/Mathematics/Social Studies](#))

0. None
1. Less than 1 year
2. 1-2 years
3. 3-5 years
4. 6-10 years
5. 11-20 years
6. 21 or more years

[ALL]

VI.3. **Excluding student teaching, how many years had you taught at your current school before the start of the 2024-25 school year?** *Mark one only*

(Source: new question based on format of the [2022 Operational Background, Education, and Training Grade 8 Teacher Questionnaire Reading/Mathematics/Social Studies](#))

0. None
1. Less than 1 year
2. 1-2 years
3. 3-5 years
4. 6-10 years
5. 11-20 years
6. 21 or more years

[ALL]

VI.4. **What is the highest academic degree you hold?** *Mark one only*

(Source: [2022 Operational Background, Education, and Training Grade 8 Teacher Questionnaire Reading/Mathematics/Social Studies](#))

1. High school diploma
2. Associate's degree/vocational certification
3. Bachelor's degree
4. Master's degree
5. Education specialist's or professional diploma based on at least one year's work past master's degree
6. Doctorate (PhD; EdD)
7. Professional degree (e.g., M.D., LL.B., J.D., D.D.S.)

[ALL]

VI.5. **Do you hold a regular or standard (permanent) certificate that is valid in the state in which you are currently teaching?** *Mark one only*

(Source: adapted from [2022 Operational Background, Education, and Training Grade 8 Teacher Questionnaire Reading/Mathematics/Social Studies](#))

1. Yes, I hold a permanent certificate
2. No, I hold a temporary or provisional certificate, and I am working towards regular or standard certification.
3. No, I hold a temporary or provisional certificate, and I am not working towards regular or standard certification.

[ALL]

VI.6. **Are you Hispanic or Latino?** *Mark one only*

1. Yes
0. No

[ALL]

VI.7. **What is your race?** *Mark all that apply*

1. American Indian or Alaska Native
2. Native Hawaiian or other Pacific Islander
3. Asian
4. Black or African American
5. White

[ALL]

VI.8. **Are you...?** *Mark all that apply*

1. Female
2. Male
3. Transgender, nonbinary, or another gender

THANK YOU FOR COMPLETING THIS SURVEY!