

Appendix B: Teaching Fractions Toolkit Evaluation Teacher Survey

Screening question

Do you provide math instruction to grade 6 students in the current school year (2024-2025)?

Yes

No

If NO, Stop the survey

Informed consent for participation

Dear Teacher,

Thank you for participating in the Teaching Fractions Toolkit (TFT) study being conducted by the *Regional Educational Laboratory* (REL) Midwest. We know that your time is valuable, and we greatly appreciate your willingness to complete this questionnaire.

Purpose. Funded by the U.S. Department of Education and developed by the REL Midwest, the TFT provides resources to support effective grade 6 fractions instruction based on evidence-based recommendations in the IES Practice Guide [Developing Effective Fractions Instruction for Kindergarten through 8th Grade](#). Your school is participating in a study of the impact of TFT on teacher and student outcomes. As part of this study, you are invited to complete this online teacher survey.

Procedure. This online survey takes about 20-30 minutes to complete. We will send you a \$30 Amazon gift card for completing this online survey. We recommend that you complete the survey in one sitting.

Risks/Benefits. There are no foreseeable risks associated with this survey. Your participation in the survey is voluntary, and you may skip any item if you are uncomfortable responding. You can decide not to participate or to discontinue your participation at any time without penalty or loss of benefits.

Confidentiality. All information obtained in this survey is under the confidentiality and data protection requirements of the Institute of Education Sciences (The Education Sciences Reform Act of 2002, Title I, Part E, Section 183). Only REL Midwest evaluation team members with training in how to deal with sensitive and confidential data will be allowed access to identifiable information. You will not be identified by name nor will the data be presented in a manner that will allow for the identification of any participating individual. Deidentified data from this survey could be used for future research studies or distributed to another investigator for future research studies without additional informed consent.

Questions? If you have any questions or concerns about participation, please contact Dr. Yinmei Wan, study principal investigator, at ywan@air.org or (630) 649-6554. If you have concerns or questions about your rights as a research participant, contact the chair of the Institutional Review Board (IRB) at the American Institutes for Research at IRBChair@air.org, toll free at 800-634-0797, or in writing c/o AIR IRB, 1400 Crystal Drive, 10th Floor, Arlington, VA.

You are being asked to participate in the data collection for the evaluation of the TFT study. Involvement entails participating in the data collection activities described above. Please check one of the boxes below:

- YES, I have read and understand the above and give my consent to participate in the online teacher survey for the TFT Study.
- NO, I have read and understand the above, but I do not give my consent to participate in the spring online teacher survey for the TFT Study.

Please read the following instructions before you start:

The questionnaire contains four sections [three sections for the version for control schools]. Although we recommend doing this survey in one session, you may pause and come back to the same place in your survey by using your individual survey link. You may go back and forth using the survey controls to change responses.

Answering all the questions in each section will provide the study with useful data about your school. There are no right or wrong answers to the questions in this survey. You may skip any questions that you feel uncomfortable answering.

Please hit the "NEXT" or "SUBMIT" button at the end of each section for your responses to be recorded.

Section I. Attitudes and beliefs (all teachers)

This section asks about your beliefs about efficacy with regard to teaching math. Please answer the questions based on your current experience or situation.

1. To what extent can you...?	1 Not at all	2 Very little	3 Somewhat	4 Quite a bit	5 A great deal
a) Motivate students who show low interest in mathematics					
b) Help your students value learning mathematics					
c) Craft relevant questions for your students related to mathematics					
d) Get your students to believe they can do well in mathematics					
e) Use a variety of assessment strategies in mathematics					
f) Provide an alternative explanation or an example in mathematics when students are confused					
g) Implement alternative teaching strategies for mathematics in your classroom					

Note. This measure (self-efficacy for pedagogy in mathematics) was previously validated in McGee & Wang, 2014.

2. How well can you teach students to...?	1 Not well at all	2 Slightly well	3 Somewhat well	4 Quite well	5 Extremely well
a) Describe characteristics of different types of numbers (that is, positive/negative numbers, rational/irrational numbers). ^a					
b) Use strategies for composing and decomposing numbers by manipulating place value in addition and subtraction. ^a					
c) Use strategies for composing and decomposing numbers by manipulating place value in multiplication and division. ^a					
d) Convert a fraction to a decimal and vice versa.					
e) Compare equivalence of fractions and decimals. ^a					
f) Interpret inverse relationships between operations (that is, +, - and *, ÷).					
g) Manipulate points and figures on coordinate planes. ^a					
h) Collect, plot, and interpret data (on any type of graph).					
i) Find area and perimeter. ^a					
j) Convert between units in the same system (that is, grams → kilograms, inches → yards).					
k) Convert between units in a different system (that is, kilograms → pounds, inches → centimeters).					
l) Find and interpret absolute values for numbers. ^b					
m) Discover and create mathematical patterns.					
n) Interpret variables in an algebraic equation.					
o) Find and interpret measures of center and spread for data sets. ^b					

^a The evaluation team made minor changes to the original wording.

^b New item added by the evaluation team to replace the original item.

Note. The original scale (self-efficacy for pedagogy in mathematics) was validated in McGee & Wang, 2014.

3. Please indicate how much you disagree or agree with the following statements related to <u>using visual representations in mathematics.</u>	1 Strongly disagree	2 Disagree	3 Agree	3 Strongly agree
a) I am confident I can identify key mathematical relationships in a given visual representation, such as a double number line or a tape diagram, to solve a ratio and proportional reasoning task.				
b) I am confident I can translate quantitative information into a visual representation to solve a ratio and proportional reasoning task.				
c) I am confident I can create visual representations, such as double number lines and tape diagrams, to solve ratio and proportional reasoning tasks.				
d) I am confident I can use different visual representations, such as double number lines and tape diagrams, to solve the same ratio and proportional reasoning task.				
e) I am confident I can describe the connections between a visual representation and an algorithmic approach to solving a ratio and proportional reasoning task.				

Note. The original measure (self-efficacy related to using with visual representations in mathematics) was validated in DePiper et al., 2019. The original measure used a 7-point rating scale (strongly disagree, somewhat disagree, disagree, neither agree nor disagree, agree, somewhat agree, strongly agree). The evaluation team changed it to a 4-point rating scale.

4. Please indicate how much you disagree or agree with the following statements related to <u>teaching with visual representations in mathematics.</u>	1 Strongly disagree	2 Disagree	3 Agree	4 Strongly agree
a) I am confident I can help students identify key mathematical relationships in a given visual representation, such as a double number line or a tape diagram, to solve a ratio and proportional reasoning task.				
b) I am confident I can help students translate quantitative information into a visual representation to solve a ratio and proportional reasoning task.				
c) I am confident I can help students learn to create visual representations, such as double number lines and tape diagrams, to solve ratio and proportional reasoning tasks.				
d) I am confident I can help students learn to use different visual representations, such as double number lines and tape diagrams, to solve the same ratio and proportional reasoning task.				
e) I am confident I can help students learn to describe the connections between a visual representation and an algorithmic approach to solving a ratio and proportional				

reasoning task.				
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Note. The original measure (self-efficacy related to teaching with visual representations in mathematics) was validated in DePiper et al., 2019. The original measure used a 7-point rating scale (strongly disagree, somewhat disagree, disagree, neither agree nor disagree, agree, somewhat agree, strongly agree). The evaluation team changed it to a 5-point rating scale.

Section II. Professional development and time spent on teaching fractions in the 2024/25 school year [2023/24 for baseline survey] (all teachers)

The next set of questions focus on the professional development you have participated in during the 2024/25 school year and the amount of time you spent on teaching fractions.

5. During the 2024/25 school year, approximately how much time you spend on teaching fractions in your math class per week?

- Less than 30 minutes
- 30–60 minutes
- 61–90 minutes
- 91–120 minutes
- More than 120 minutes

6. During the 2024/25 school year, how many hours in total have you spent in formal in-service/professional development (for example, workshops, seminars) for mathematics?

- None
- Less than 6 hours
- 6-15 hours
- 16-35 hours
- More than 35 hours

7. During the 2024/25 school year, did you participate in or lead any of the following professional development activities related to the teaching of mathematics? Select all that apply.

- College course taken after your first certification
- Workshop or training session
- Conference or professional association meeting
- Observational visit to another school
- Mentoring and/or peer observation and coaching as part of a formal arrangement
- Committee or task force focusing on curriculum, instruction, or student assessment
- Regularly scheduled discussion or study group
- Teacher collaborative or network, such as one organized by an outside agency or over the Internet
- Individual or collaborative research
- Independent reading on a regular (for example, monthly) basis—for example, educational journals, books, or the Internet
- Co-teaching/team teaching
- Consultation with a mathematics specialist

8. Consider all of the professional development activities you participated in during the 2024/25 school year (including in summer 2024). To what extent did you learn about each of the following topics? Select all that apply.

	Not at all	Small extent	Moderate extent	Large extent
a) Math content with an emphasis on whole numbers ^a				
b) Math content with an emphasis on fractions, ratios, rates, and proportional reasoning ^a				
c) Math content with an emphasis on algebra ^a				
d) Math content with an emphasis on geometry ^a				
e) Math content with an emphasis on probabilities and statistics ^a				
f) How students think about and learn mathematics ^a				
g) How to plan and structure lessons ^a				
h) How to use representations to convey mathematical concepts ^a				
i) How to ask students questions and provide feedback ^a				
j) How to use your mathematics curriculum/textbook ^a				
k) How to interpret and use assessment data to guide instruction ^a				
l) How to organize and manage a classroom ^a				
m) How to teach students with diverse needs ^a				
n) How to use technology in mathematics instruction ^a				
o) Preparation of students for district and state assessments ^b				
p) Strategies for teaching mathematics to students from diverse backgrounds (including English learner students) ^b				

^a Items drawn from Garet et al., 2010.

^b Items drawn from NAEP Mathematics Teacher Questionnaire 2015.

Note. Five measures used to examine PD focus were previously validated in Garet et al., 2010, including emphasis on fractions and decimals, emphasis on percent, ratio, rate, and proportion, emphasis on whole/numbers/integers, algebra, geometry, probability and statistics, emphasis on pedagogical topics intervened upon, and emphasis on pedagogical topics not intervened upon.

Section III. Teaching Fractions Toolkit (TFT) implementation (teachers in treatment schools only)

The next set of questions focus on your experience with the TFT professional learning and resources during the 2024/25 school year.

9. To what extent do you disagree or agree with the following statements?

<i>My experiences with the TFT professional learning and resources have helped me improve my teaching in the following areas:</i>	1 Strongly disagree	2 Disagree	4 Agree	5 Strongly agree
a) Use measurement activities and number lines to help students understand that fractions are numbers, with all the properties that numbers share.				
b) Provide opportunities for students to locate and compare fractions on number lines.				
c) Use number lines to improve students' understanding of fraction equivalence, fraction density (the concept that there are an infinite number of fractions between any two fractions), and negative fractions.				
d) Help students understand that fractions can be represented as common fractions, decimals, and percentages, and develop students' ability to translate among these forms.				
e) Use area models, number lines, and other visual representations to improve students' understanding of formal computational procedures.				
f) Provide opportunities for students to use estimation to predict or judge the reasonableness of answers to problems involving computation with fractions.				
g) Address common misconceptions regarding computational procedures with fractions.				
h) Present real-world contexts with plausible numbers for problems that involve computing with fractions.				
i) Develop students' understanding of proportional relations before teaching computational procedures that are conceptually difficult to understand (for example, cross-multiplication). Build on students' developing strategies for solving ratio, rate, and proportion problems.				
j) Encourage students to use visual representations to solve ratio, rate, and proportion problems.				
k) Provide opportunities for students to use and discuss alternative strategies for solving ratio, rate,				

and proportion problems				
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10. To what extent do you disagree or agree with the following statements?

<i>My experiences with the TFT professional learning and resources have helped me improve my knowledge in the following areas:</i>	1 Strongly disagree	2 Disagree	4 Agree	5 Strongly agree
a) Understanding of fraction concepts and operations.				
b) Using a number of different representations and selecting an appropriate representation for each situation				
c) Understanding types of errors and misconceptions that students are likely to generate during fraction instruction				
d) Understanding of fraction concepts that are taught at students' grade level, as well as the concepts that come before and after				
e) Using representations effectively to connect to the concepts being taught				
f) Learning about how students develop an understanding of fraction concepts and the difficulties that they face in properly understanding fraction				

11. Please indicate the extent to which each of the following conditions is an obstacle to your efforts to implement the information you learned from the Teaching Fractions Toolkit (TFT) professional learning and resources. If the condition does not exist in your school, please mark "Not applicable."

	1 N/A; Does not exist	2 Exists <u>but not</u> an obstacle	3 Exists; Minor obstacle	4 Exists; Major obstacle
a) Lack of support from school administration				
b) My own limited knowledge of how to effectively implement the strategies emphasized in TFT				
c) Too many students for whom I am responsible				
d) Too much variation in achievement levels among my students				
e) Too much variation in age or maturity among my students				
f) Lack of flexibility in the curriculum I am required to teach (that is, need to teach specific material in a specific time frame)				
g) Pressure to cover specific material as a result of state or district standards or testing requirements				
h) Excessive amounts of time I need to spend developing TFT-related lessons				
i) Excessive amounts of time needed to participate in TFT professional learning activities				

j) Too few opportunities to participate in TFT professional learning activities				
k) Lack of support from my local facilitator				

12. To what extent do you disagree or agree with the following statements?

	1 Strongly disagree	2 Disagree	4 Agree	5 Strongly agree
a) The TFT professional learning and resources have helped improve the quality of my teaching.				
b) The TFT professional learning and resources have helped me prepare students for learning math at more advanced levels.				
c) The TFT professional learning and resources have helped me get students interested in math.				
d) I've felt highly engaged in the TFT professional learning and resources.				
e) The TFT professional learning is engaging.				
f) The TFT PD materials and resources are easy to use.				

13. Did the time you spent on teaching fractions this year increase or decrease significantly because of the TFT professional learning and resources or stay about the same?

- Increase significantly
- Decrease significantly
- Stay about the same

14. You indicated that the time you spent on teaching fractions (Increase significantly/Decrease significantly) this year because of the TFT professional learning and resources. Was this change helpful?

- Yes
- No
- Unsure

15. How often do you use what you're learning in TFT professional development sessions in your classroom practice?

	Never	Rarely	Sometimes	Frequently
a) I use the strategies provided in TFT professional learning sessions in my classroom.				
b) I use the resources provided in the TFT to plan lessons and activities.				
c) I use the activities we do in TFT professional learning sessions in my classroom.				

16. Overall, how supportive has your school leadership been for your implementation of the TFT?

- Not supportive
- Slightly supportive
- Supportive
- Highly supportive

17. What were the most helpful parts or features of the TFT?

18. What improvements are needed for the TFT? Please share suggestions for how the toolkit can be improved.

Section IV. Teacher background (all teachers; spring 2025 only)

Please complete the following questions about your background.

17. Are you a special education teacher?

- Yes
- No

18. Are you a bilingual, dual language, ESL, or ELL teacher?

- Yes
- No

19. Including the current year, how many years have you been a teacher? (Exclude extended periods of absence, such as career breaks.)

_____ years

20. Including the current year, how many years have you been a teacher at THIS school? (Exclude extended periods of absence, such as career breaks.)

_____ years

21. Did you have a major, minor, or special emphasis in any of the following subjects as part of your undergraduate coursework? Select all that apply

	<i>Undergraduate coursework</i>		<i>Graduate coursework</i>	
	Yes, a major	Yes, a minor or special emphasis	Yes, a major	Yes, a minor or special emphasis
Math education: elementary grades				
Math education: middle grades				
Math education: secondary grades				
Math				
Other math-related subject such as statistics				
Education (including secondary education)				
Special education (including students				

with disabilities)				
English language learning				

22. In the table below, please tell us what type(s) of teacher license you currently have, the subject area(s), and the grade level(s).

Type of license (for example, Professional Educator License [PEL], Educator License with Stipulations [ELS], and Substitute License)	Endorsement subject area (for example, mathematics, biology, generalist)	Endorsement grade level (for example, EC-2, Elementary 1-6, Middle grades 5-8, Senior High 9-12, CTE 5-12, etc.)

Thank you for completing the TFT study survey!