49th Annual Conference

National Association for Bilingual Education (NABE)

Las Vegas, NV

Friday, February 25-28, 2020

Wednesday,
February 26, 2020
4:40 PM - 6:00 PM
Trinidad 6

Scaffolding Mathematical Biliteracy Practices with Novice Bilingual Teachers

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Alejandra Treviño, Lina Martin Corredor, Cynthia Lima

NABE Conference, Wednesday, February 26, 2020
4:40 PM - 6:00 PM, Trinidad 6

Santa Clara University

UTSA

UNIVERSITY OF CALIFORNIA SANTA CRUZ

Agenda

Introductions & Overview of MALLI Project (MB)

MALLI Framework (MB)

MALLI Practices (AT)

Rubric and Video Examples (JS)

Example 1. Together
Example 2. In Pairs
Example 3:

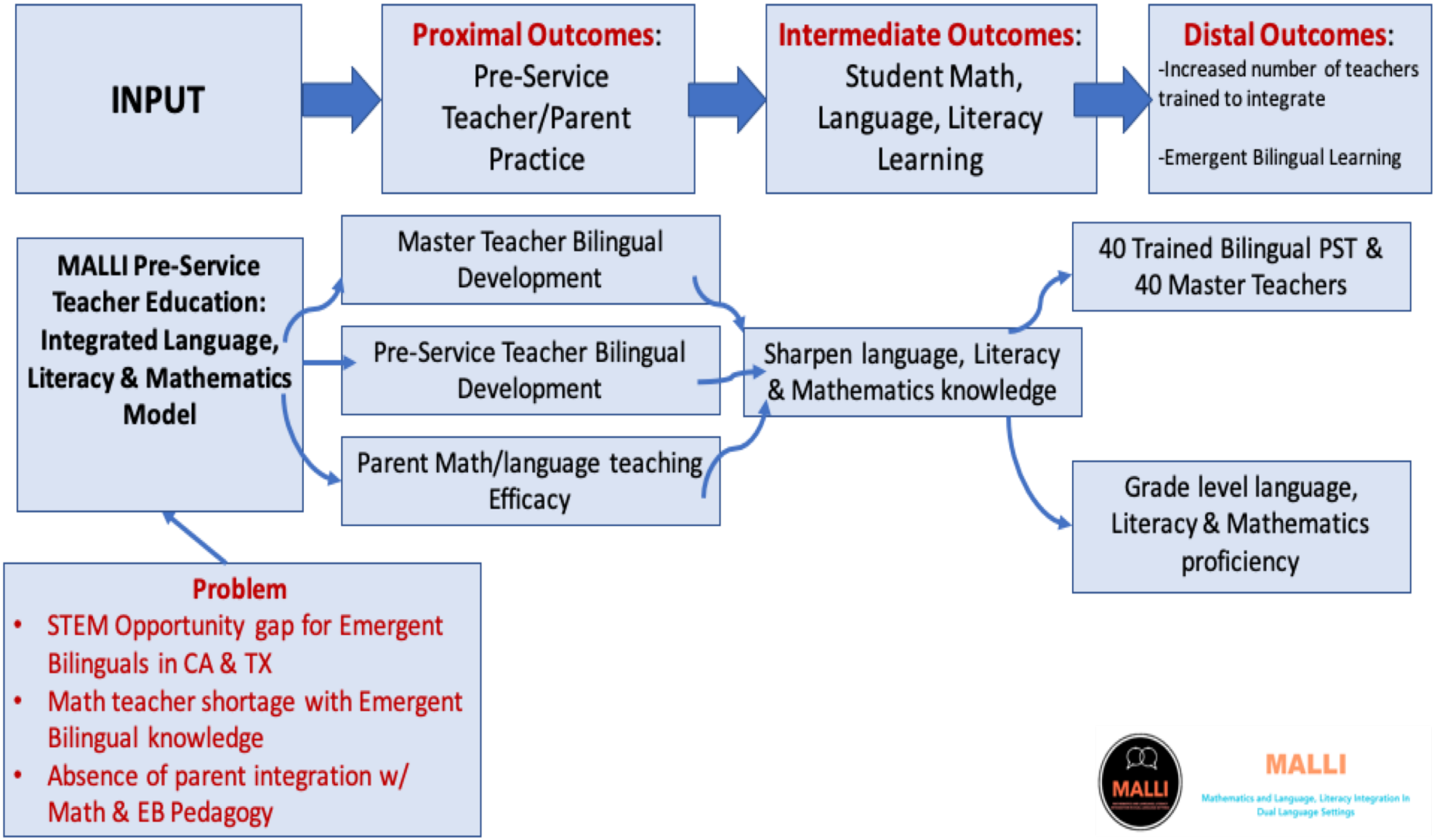
Emerging Results & Resources (AT)

Questions/Discussion (ALL)

MALLI Collaborators

PI/Co-PIs	School Districts	Advisory Board
• **Marco Bravo, Claudia Rodriguez-Mojica, Kathy Stoehr,** Santa Clara University • **Eduardo Mosqueda, Kip Téllez,** Univ. California Santa Cruz • **Jorge Solís and Cynthia Lima** Univ. Texas at San Antonio	• Northern California • South Central Texas	• **Dr. Iliana Alanis**, Univ. Texas at San Antonio • **Dr. Sylvia Celedon Pattichis**, Univ. of New Mexico • **Maria Madrigal** • **Dr. Elizabeth Van Es**, Univ. California Irvine

Theory of Change

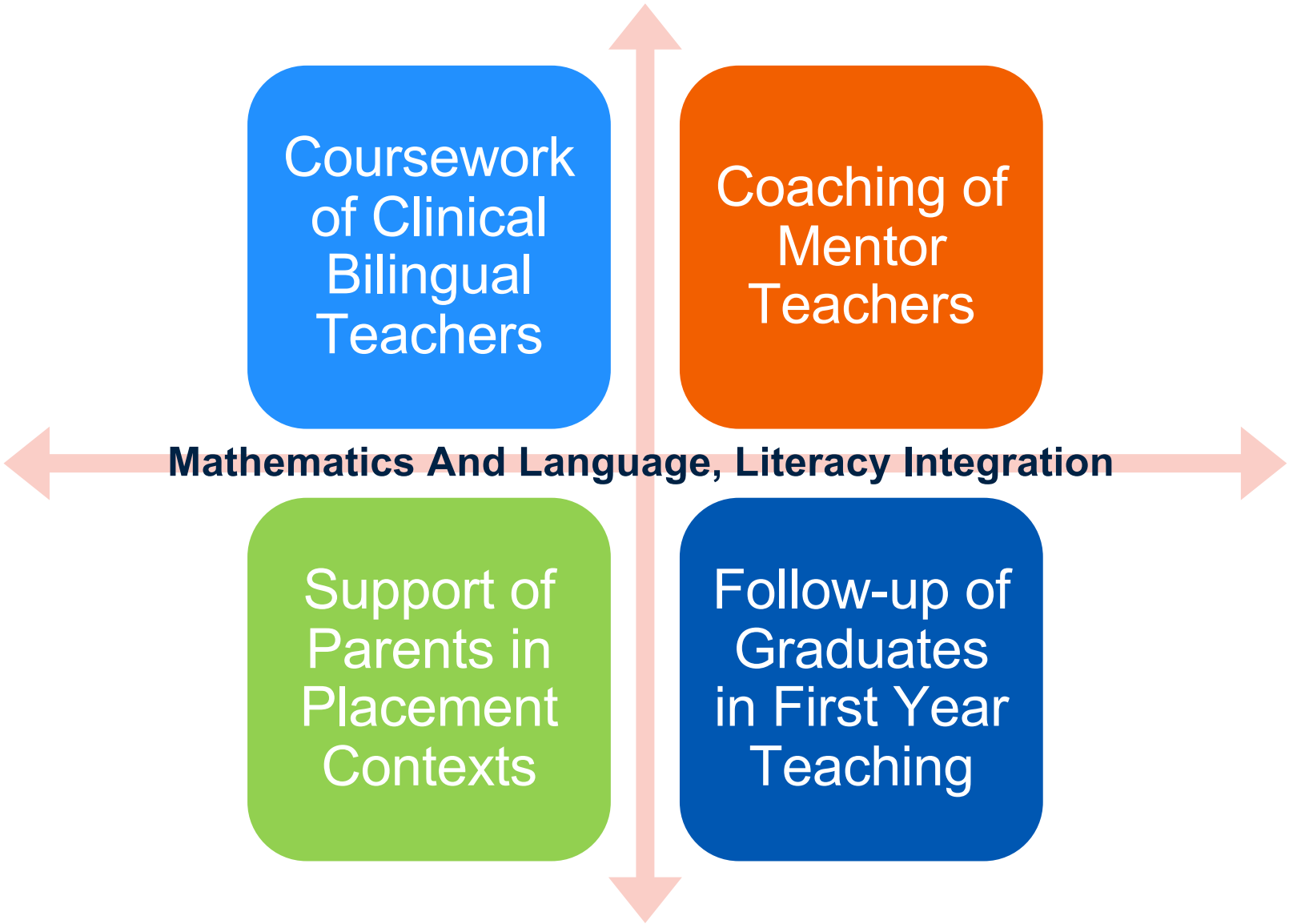


MALLI

Mathematics and Language, Literacy Integration In Dual Language Settings

Phase	Bilingual Teacher Candidates	Bilingual Master Teachers	Bilingual Pre-Service Teacher Graduates	Parents	K-5 EBLs
Planning (year 1)	-	-	-	-	-
Pilot (year 2)	24	40	--	25	400
Phase 1 (year 3)	20	20	20	10	400
Phase 2 (year 4)	20	20	20	10	400
Phase 3 (year 5)	--	--	20	--	--
Total	**60**	**60**	**60**	**30**	**1,200**

Integrating and Aligning Practices Across Contexts

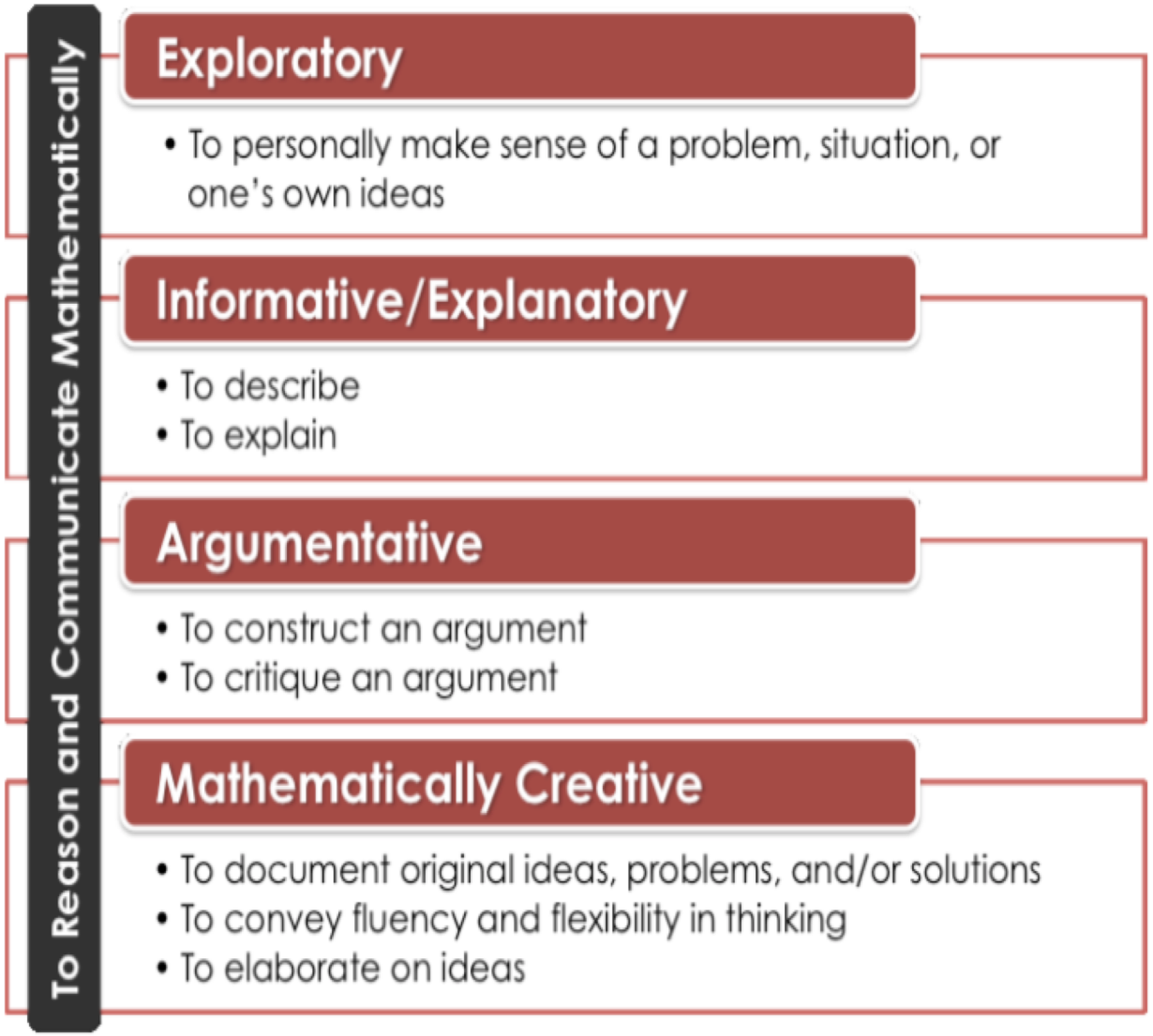


Research on Novice Bilingual Teacher Training

- **Professional identity** in bilingual contexts
- Novice bilingual teachers, **culturally diverse**
- Bilingual education, novice teacher, **teacher noticing, repertoire of practice,** and teacher development.
- **Language ideologies**, bilingual preservice teachers and teacher preparation
- Novice teachers, transformative learning, and **critical pedagogy**
- **Linguistic responsiveness**, novice teacher perceptions
- Bilingual teachers, dual language teachers, **agency, identity**, figured worlds, and preservice teachers

(Achugar, 2009; Alfaro and Bartolomé, 2017; Artiles, Barreto, Pena and McClafferty, 1998; Flores and Garcia, 2017; Musanti, 2017; Nuñez and Espinoza, 2019; Osterling and Webb, 2009; Tandon and Viesca, 2017; Varghese and Snyder, 2018)

Mathematical Writing

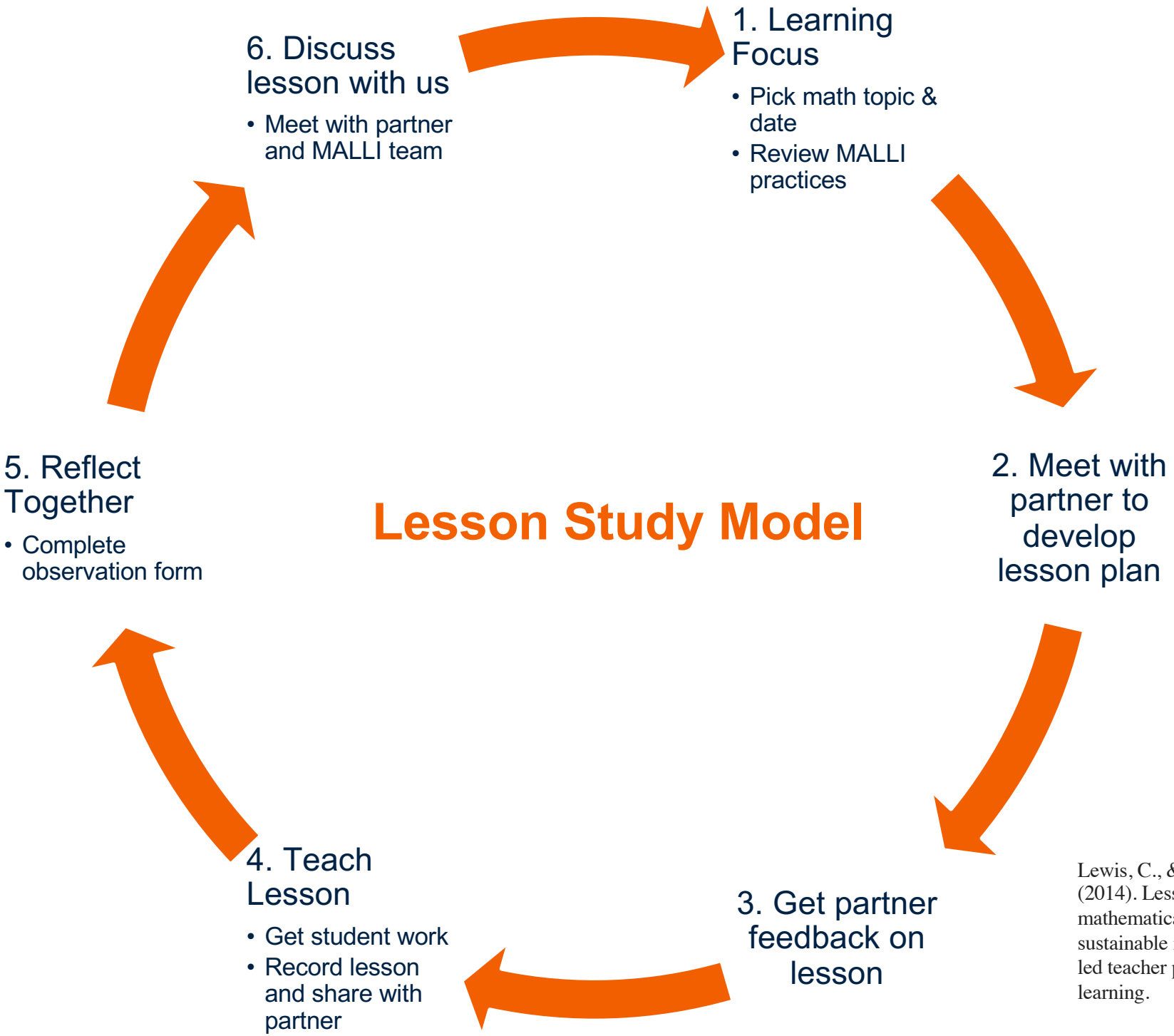


Mathematical writing can address a range of purposes and goals.

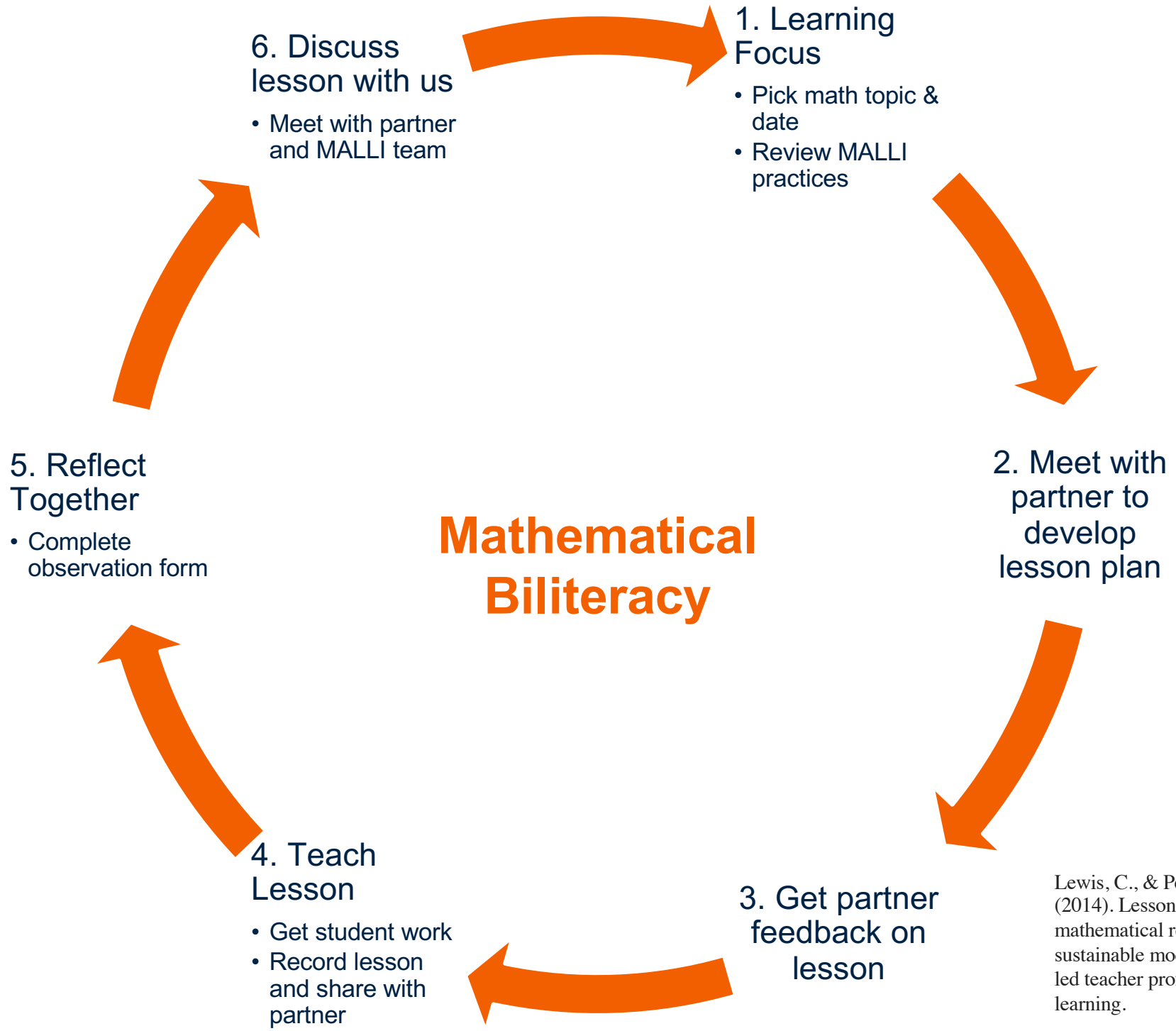
Casa, T. M., Firmender, J. M., Cahill, et al. (2016). Types of and purposes for elementary mathematical writing: Task force recommendations.

MALLI Framework and Practices

Lesson Study Model



Lewis, C., & Perry, R. (2014). Lesson study with mathematical resources: A sustainable model for locally-led teacher professional learning.



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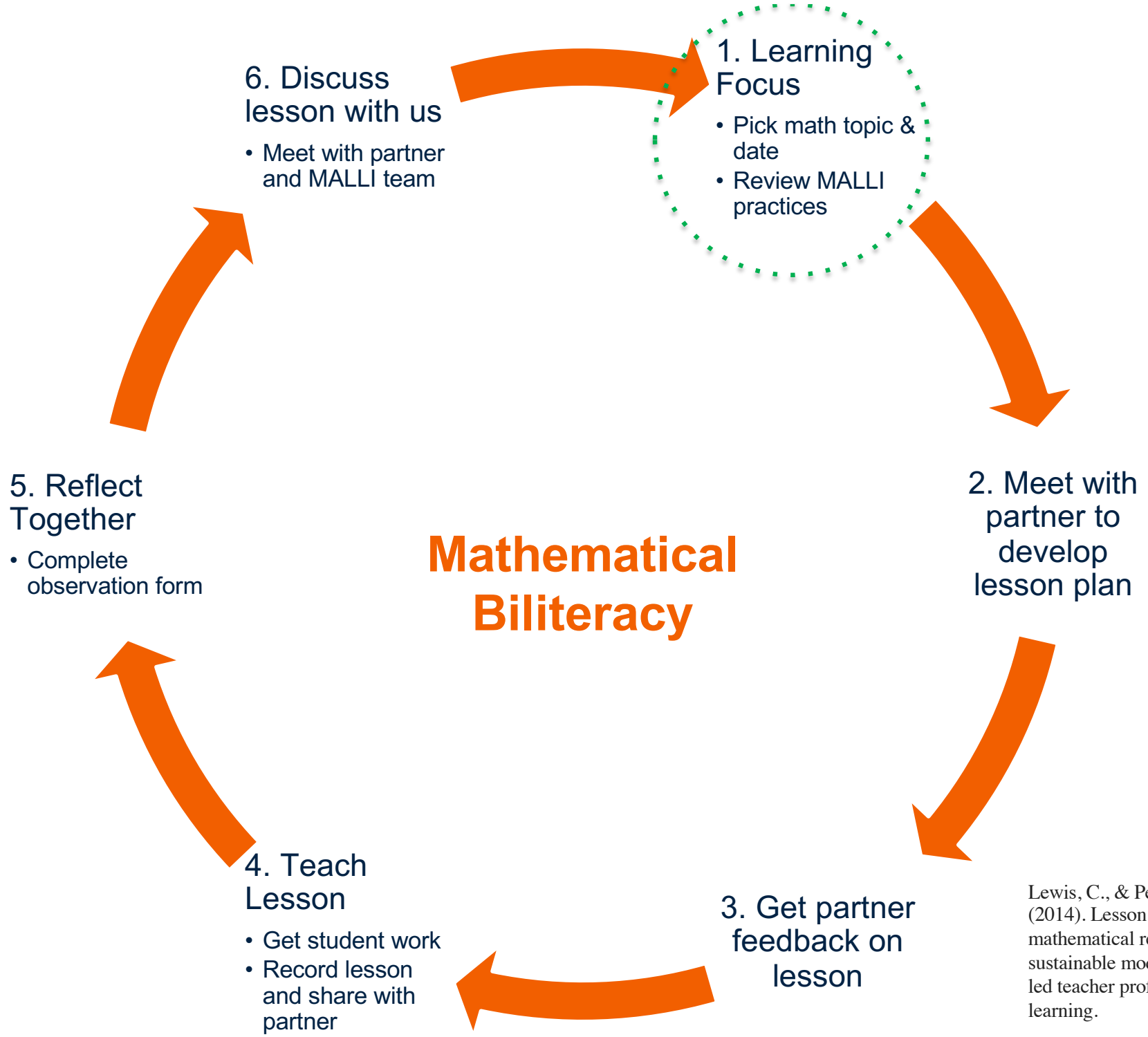

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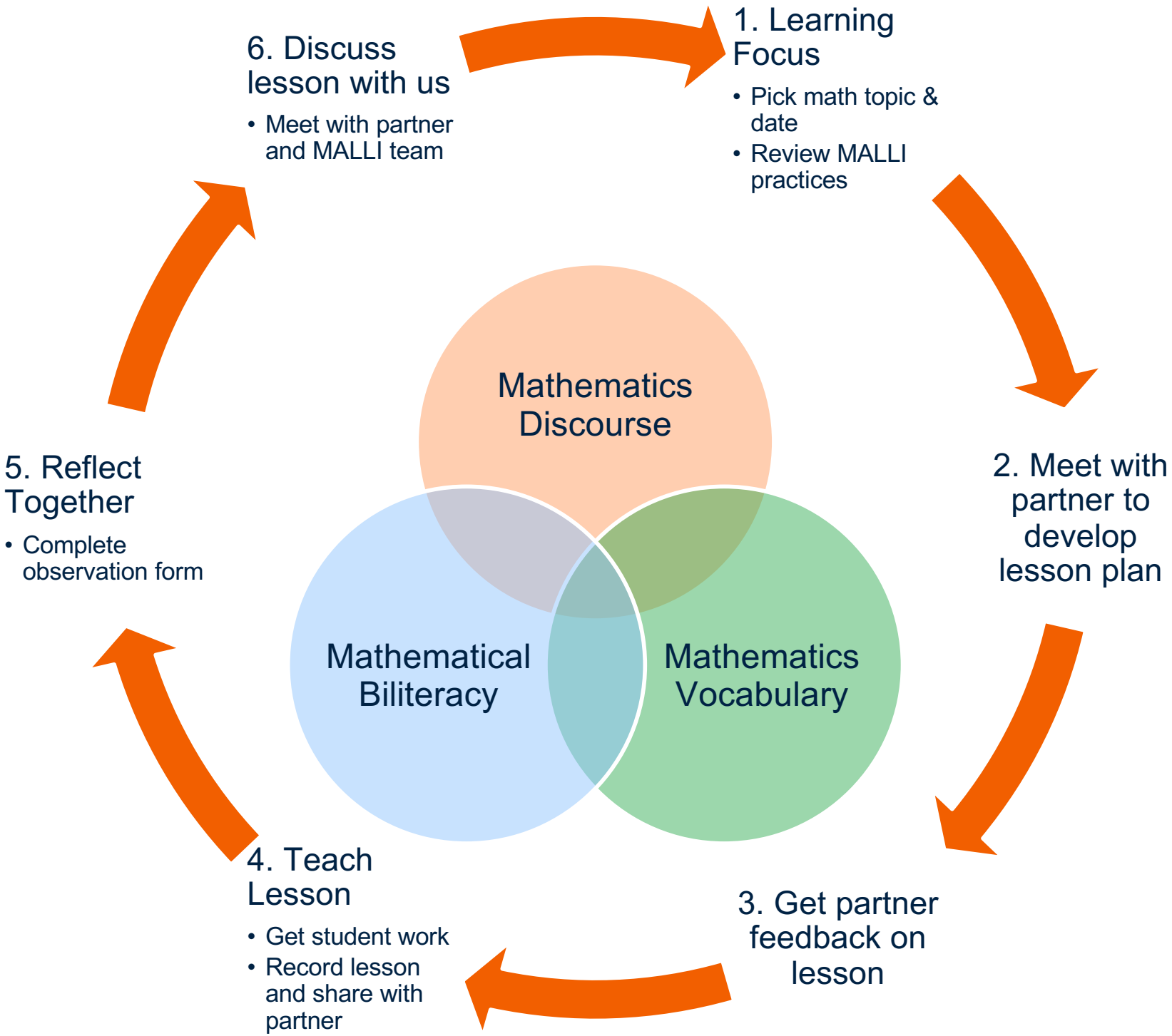
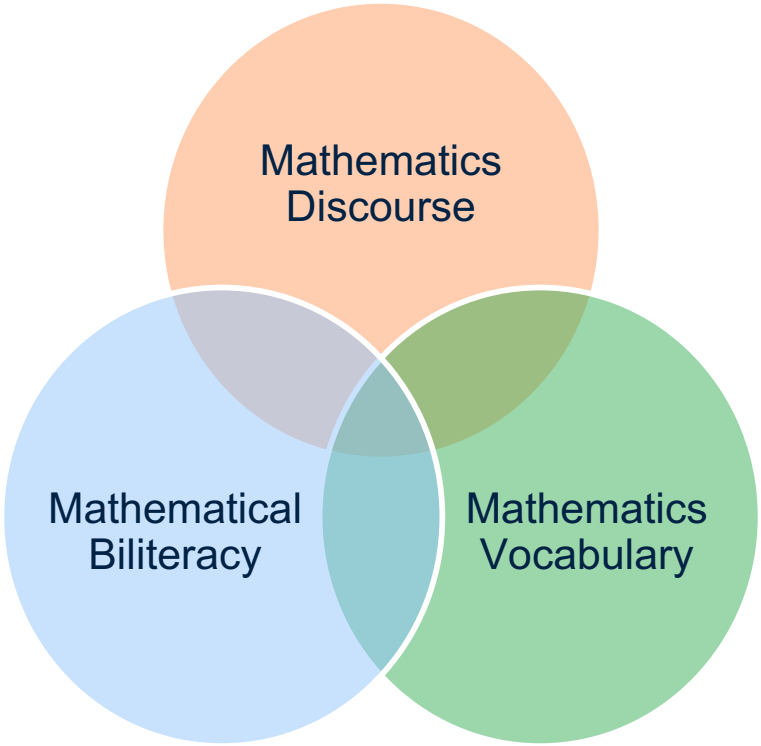

1. Learning Focus
• Pick math topic & date
• Review MALLI practices
2. Meet with partner to develop lesson plan
3. Get partner feedback on lesson
4. Teach Lesson
• Get student work
• Record lesson and share with partner
5. Reflect Together
• Complete observation form
6. Discuss lesson with us
• Meet with partner and MALLI team
Mathematics Discourse
Mathematical Biliteracy
Mathematics Vocabulary

MALLI Practices

Partner talk (5 minutes)

How do these practices look like in bilingual classrooms?



Mathematics Discourse	***Talking and acting*** *to accomplish mathematics practices such as* ***proving or explaining*** *math solutions, problems, or statements in bilingual contexts*
Mathematical Biliteracy	*Attention to* ***reading and writing*** *in mathematics including* ***discussions*** *and* ***interpretations of math texts*** *and/or how to produce different types of math texts in bilingual contexts*
Mathematics Vocabulary	*Attention to the* ***special meanings*** *of words used across languages in mathematics and how to reinforce* ***specialized and precise meanings*** *through the use of background knowledge, morphology, cognates, collocations, and noun phrases*

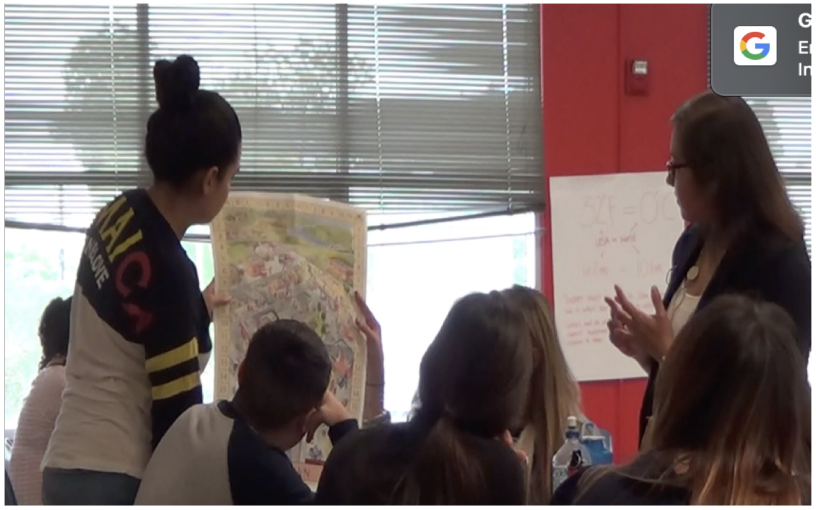
MALLI Modules of Practices

The MALLI Modules can be used for a range of professional development activities including:

- Trainer of trainers
- Administrators/Walk throughs
- University professors/Checks for fidelity
- Teachers/peer mentors

Course Re-Development
Lesson Modules

	TX Site	**CA Site**
6 Anchor Lessons	Taught in 2 of 4-course block sequence	Taught Anchor Lessons in math Methods I & II



Rubric for Observing MALLI Practices

Mathematics Discourse

Introducing (1)	Developing (2)	Refining (3)
• TI uses math talk strategies (question, revoice, linking student ideas) • Student engage in limited peer math talk	▪ TI **identifies** math talk strategies (question, revoice, linking student ideas) ▪ TI **asks students** to engage in argumentation ▪ Student engage in peer math talk	▪ TI identifies a**nd demonstrates how to** orchestrate student math talk (question, revoice, linking student ideas) ▪ TI asks students to e**ngage in argumentation using evidence** ▪ TI provides students an opportunity for s**tructured /small group discussion** ▪ TI **provides feedback** to students on how to promote math talk or argumentation

Mathematical Biliteracy

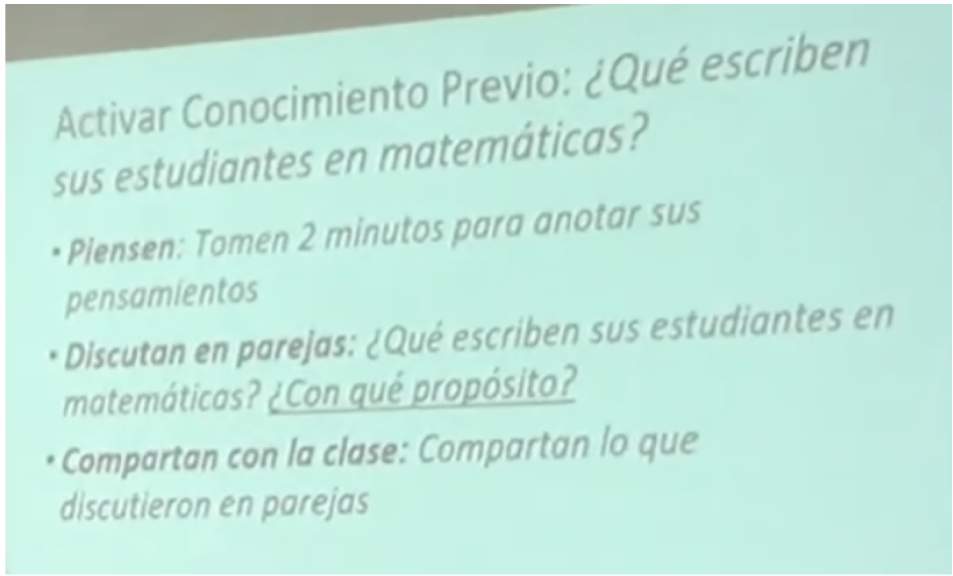
Introducing (1)	Developing (2)	Refining (3)
▪ TI talks about reading and/or writing math texts ▪ TI or students use written sample/ texts	▪ TI e**xplains the importance** of reading and/or writing math texts ▪ TI uses written sample/ texts ▪ TI **compares/ contrasts** the different math texts ▪ Students use math texts	▪ TI explains **how to read and/or write** math texts ▪ TI **asks students to interpret** written sample/ texts ▪ TI asks students to **compare/contrast t**he different math texts ▪ Students **create** and/or use math texts

Mathematics Vocabulary

Introducing (1)	Developing (2)	Refining (3)
• TI provides examples of academic terms in everyday contexts and/or math texts OR • TI **identifies academic math** terms/ concepts in a lesson • Student are able to practice using key math terms	• TI p**rovides examples of academic terms** in everyday contexts and/or math texts • TI identifies academic math terms/ concepts in a lesson • Student are able to **practice using** key math terms	• TI **identifies polysemic words** and provides examples in everyday contexts and/or math texts • TI asks students to use academic math terms/ concepts • T **offers feedback o**n student use of math terms • TI **ask students to be aware** of certain terms and meanings

Example 1

Activity:TI asks PSTs to discuss types writing in math



TERCER GRADO: ESCRITURA MATEMATICA

Direcciones: Usa la casilla para mostrar tu trabajo matemático. En las líneas de abajo, explica tu respuesta.

Es el comienzo del año escolar. La maestra está preparando materiales para su clase. Ella quiere que sus estudiantes compartan lápices y borradores. Ella tiene cinco estuches para su clase. Si la profesora quiere 25 borradores, ¿cuántos borradores más necesita para su clase?

A. Soluciona el problema en la casilla de abajo. Dibuja un representación que te pueda ayudar.

B. La maestra te ha pedido que les des instrucciones a sus estudiantes para resolver el problema de matemáticas. Escribe una explicación sobre cómo solucionaste el problema. Asegúrate de usar vocabulario matemático en tu respuesta.

4TH GRADE MATH WRITING PROMPT

Directions: Use the box to show your math work. In the lines below, explain your answer.

Your classroom needs a new carpet. The principal has asked you to find out how much carpet he will need to buy. The size of your classroom is 35 feet by 52 feet. Write an equation to represent the problem and then solve the problem.

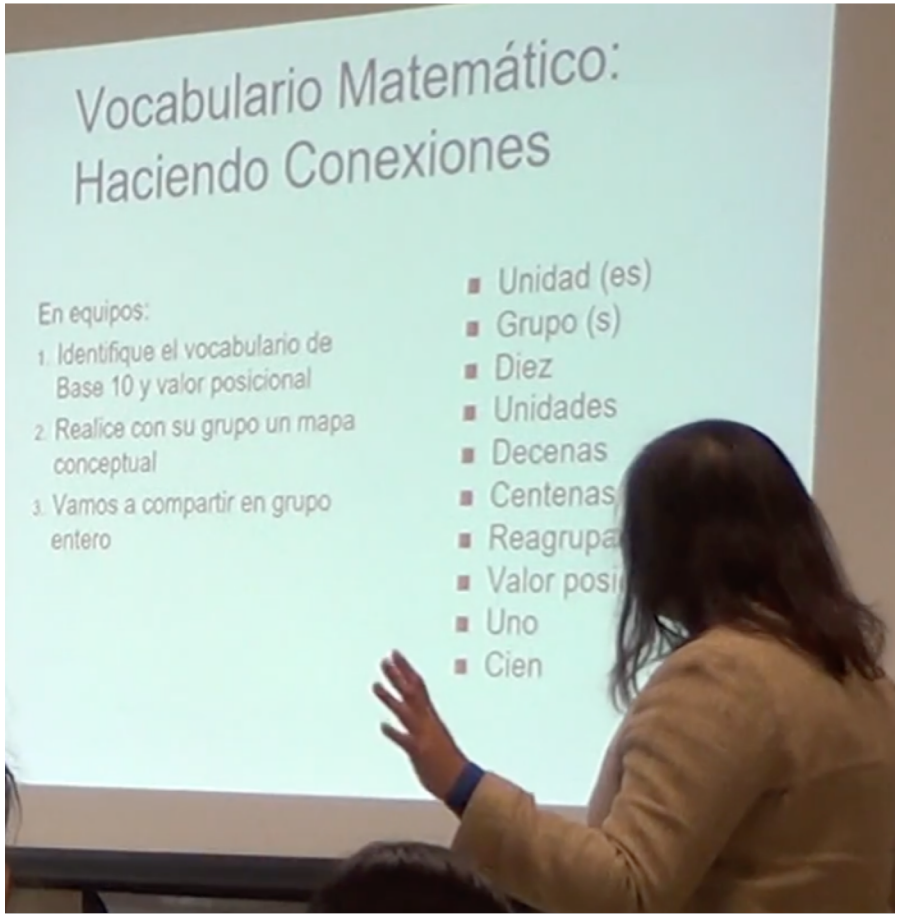
Explain to the principal how you found your answer.

Together

- What kind of opportunities to engage in MALLI practices are supported in this activity? (see rubric)
  - What do you notice?
  - What score would you give it?

Example 2

Activity:TI asks PSTs to create concept maps

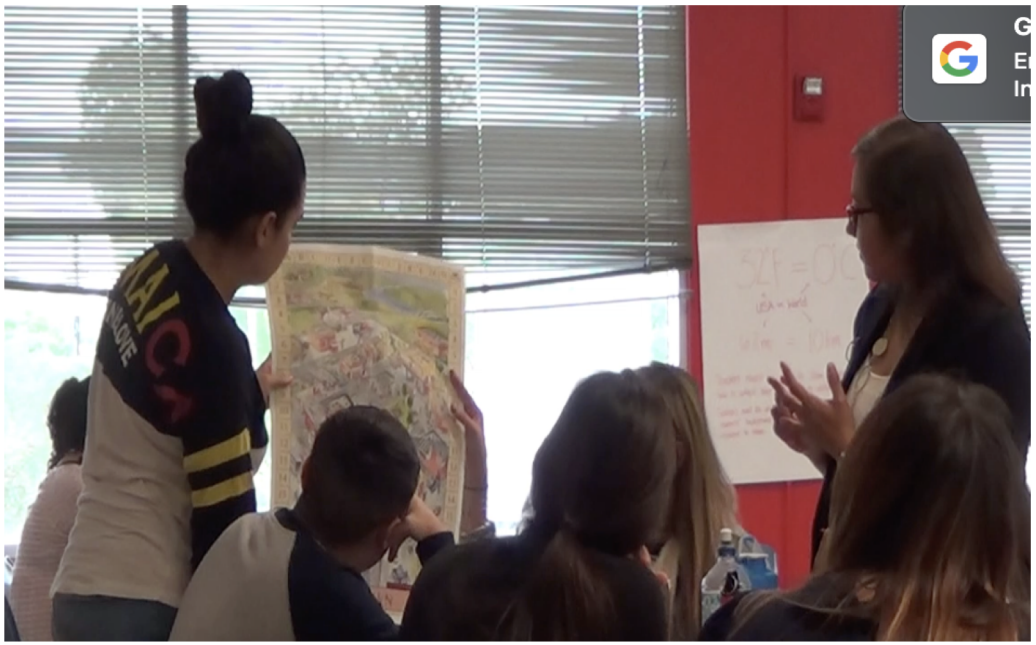


In Pairs

- Take 4 minutes
  - What do you notice?
  - What score would you give it?

Example 3

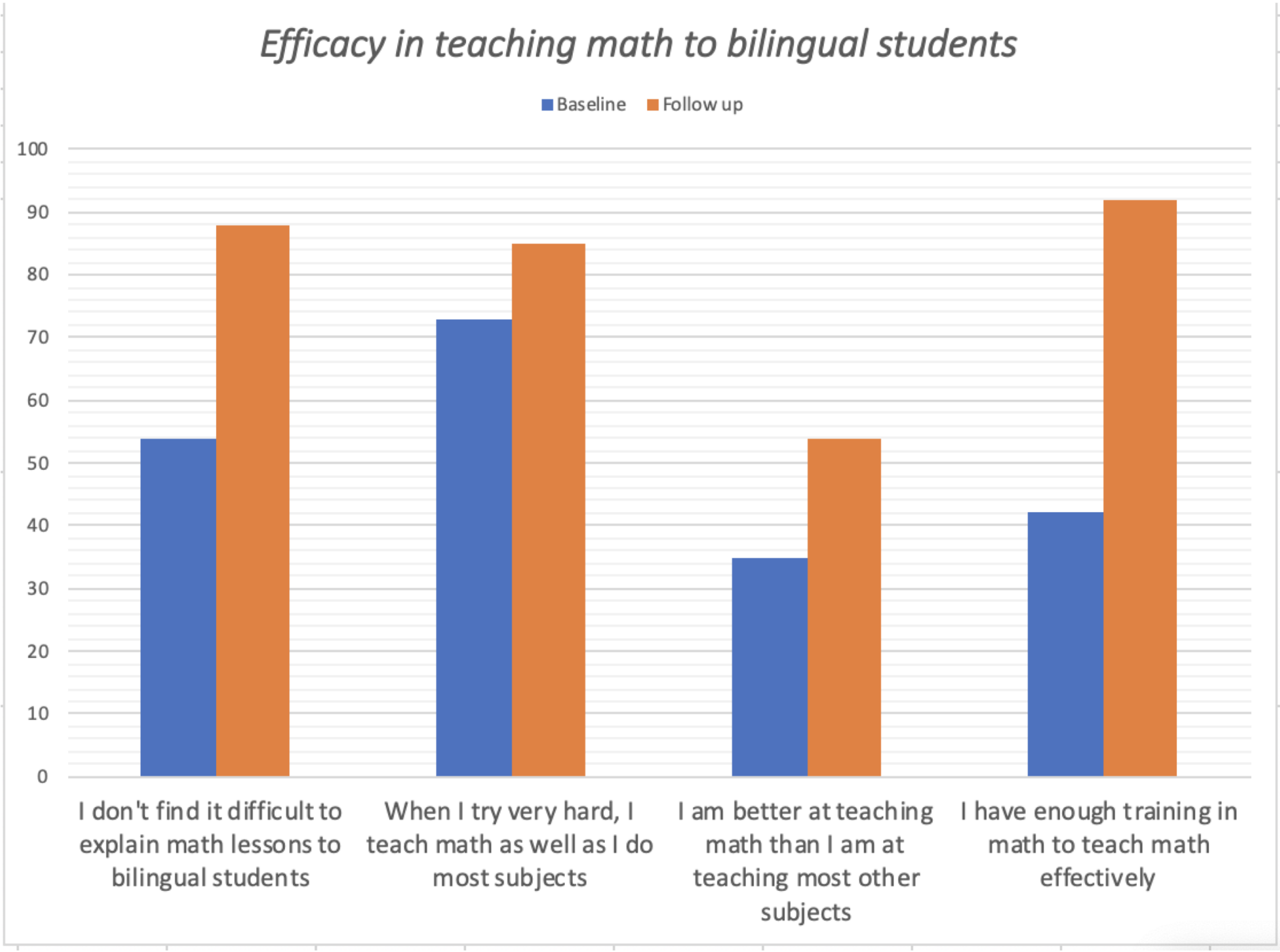
Activity: Adapting a math lesson on geometric shapes

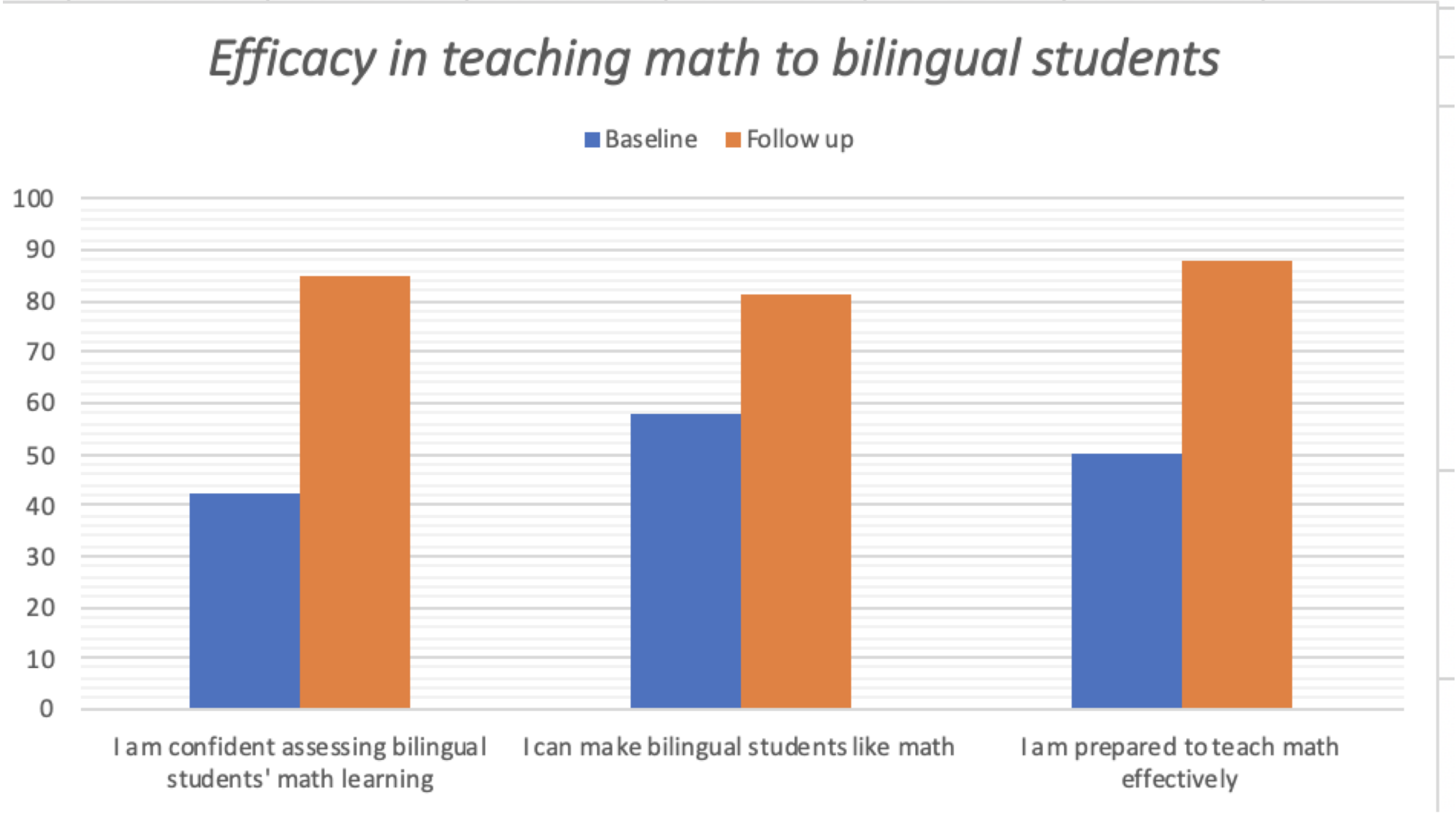


In Pairs

- Take 4 minutes
  - What do you notice about the relationship between math discourse, biliteracy, and vocabulary?
  - What score would you give it?

Emerging Results from Larger Study


Efficacy in teaching math to bilingual students
Baseline
Follow up
100
90
80
70
60
50
40
30
20
10
0
I don't find it difficult to explain math lessons to bilingual students
When I try very hard, I teach math as well as I do most subjects
I am better at teaching math than I am at teaching most other subjects
I have enough training in math to teach math effectively


Efficacy in teaching math to bilingual students
Baseline
Follow up
100
90
80
70
60
50
40
30
20
10
0
I am confident assessing bilingual students' math learning
I can make bilingual students like math
I am prepared to teach math effectively

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