3 Actions to Support English Language Learners in your Math Classroom

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Who Are We?

- Federally funded Teacher Quality Project within the Mary Lou Fulton Teachers College.
- Comprised of former teachers, coaches, administrators, and college faculty.

What Do We Do?

- Prepare educators to work with culturally & linguistically diverse students.
- Provide professional development and on-going coaching in the area of English Language Learners.

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Shift in Math Requirements

- Problem situations are language rich and require multiple steps.
- Concepts represented in multiple ways. Text can require students to translate between and among words, numbers, tables, diagrams, and symbols.
- Students will be called on to determine relevant ideas and the reasonableness of an answer.

Standards for Mathematical Practice

1. **Make sense** of problems and persevere in solving them.
2. **Reason** abstractly and quantitatively.
3. Construct viable **arguments** and **critique** the reasoning of others.
4. **Model** with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.

3 Actions to Support ELLs

1. **Mathematical Discourse-**

   Toolkit

2. **Unpacking Word**

   Problems

3. **Classroom Conversation-**

   Math Paired Protocol

structed Response

like saw 17 blue cars and 25 green cars at the
y store. How many cars did he see? Write a
mber sentence with a ☐ for the missing
mber. Explain how the number sentence
ows the problem. (CC.2.OA.1, CC.2.NBT.5)

17
+25

17+25=☐42 I got the answer by
talking in my brain and I agreed
of the answer that my brain got.

rmance Task (CC.2.OA.1, CC.2.NBT.5)

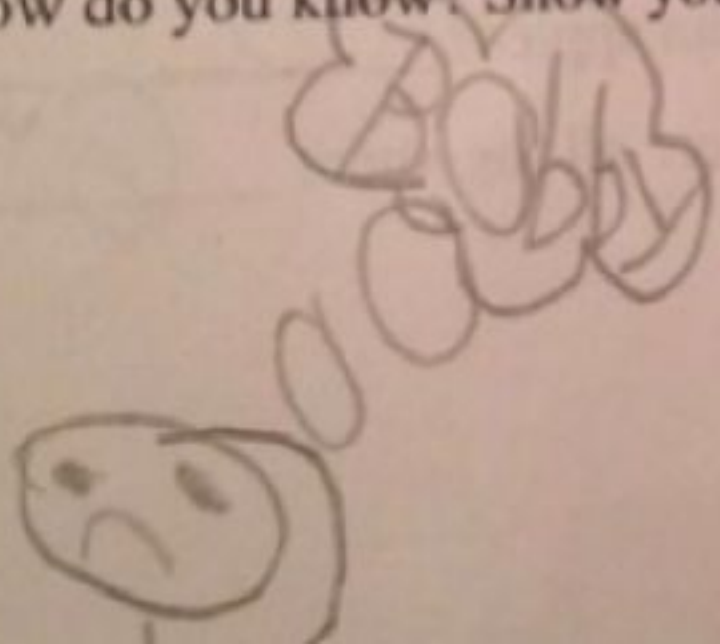
g saw these four signs at the theater.

MGSE1.NBT.7

11. Bobby has four dimes. Amy has 30 pennies. Which child has more money?

Bobby ✓

How do you know? Show your thinking.



How much less?

. The difference between 180 and 158 is 22.

Try This

Explain how you found your answer in Problem 4.

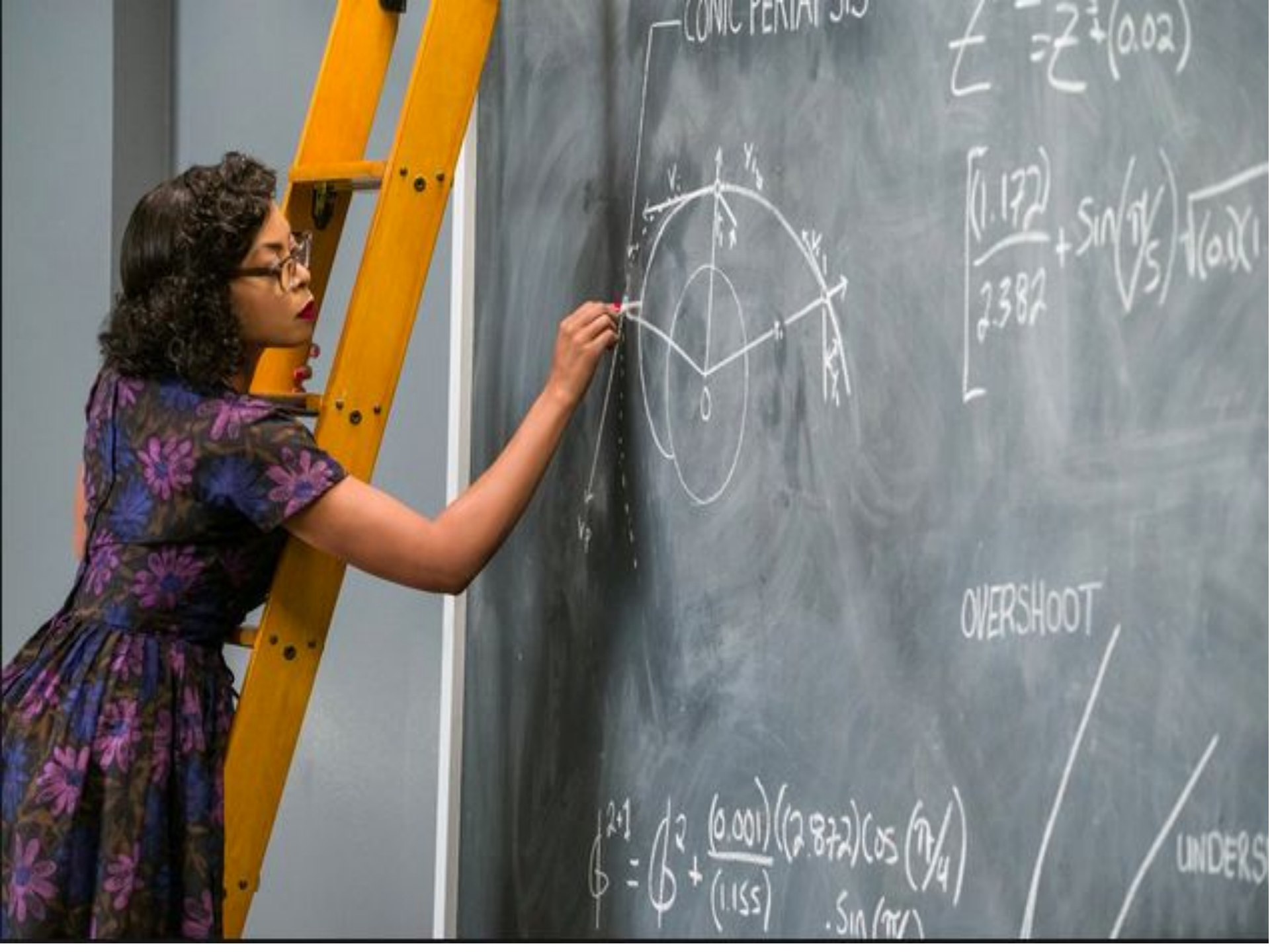
Math

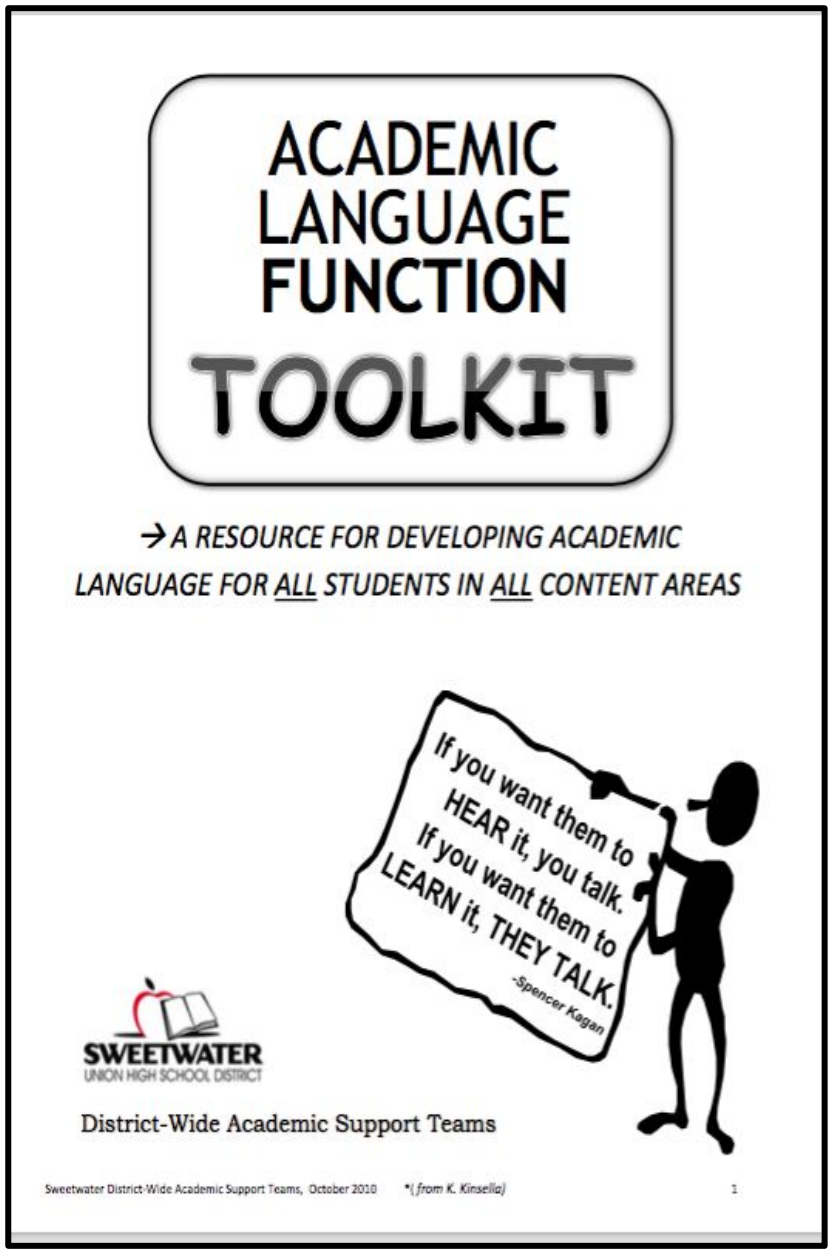
Practice

lve.

Strategy 1: Disciplinary Specific Discourse

- How members of a discipline talk, write, and participate in knowledge construction
- Must be explicitly taught


OVERSHOOT



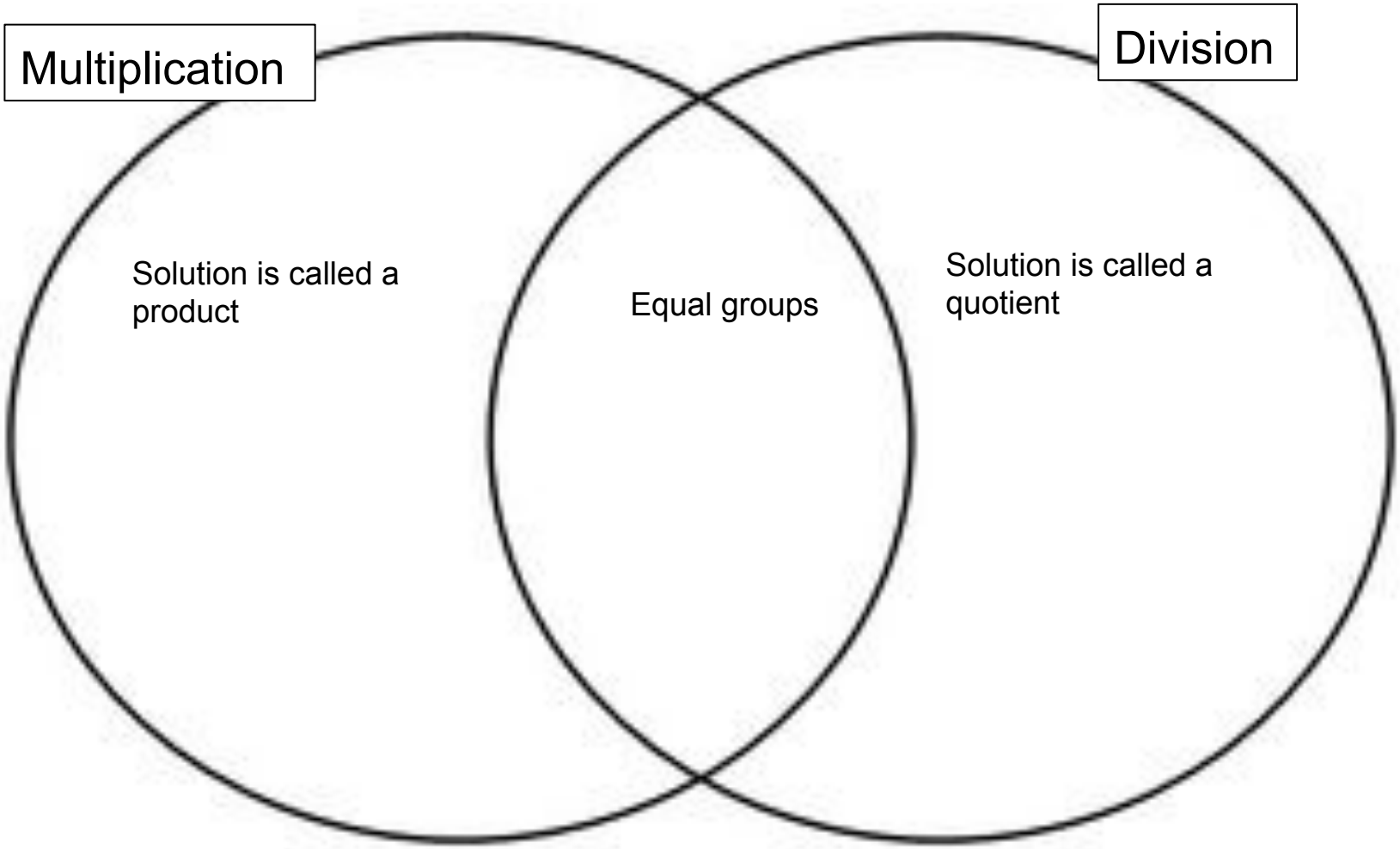
Compare and Contrast

What language functions align with mathematics?

Compare and Contrast

Let's Plan

Independently complete the graphic organizer using words, phrases, and symbols.



Let's Discuss

- Multiplication and division are similar because they both....
- Multiplication and division are rather different because while...
- Multiplication has/is _____, division has/is _____.
- Multiplication is .... similarly / in contrast, division is ....

Strategy 2: Unpacking Word Problems

Unpacking Word Problems

Mrs. McCrary wants to make a rabbit pen in a section of her lawn. Her plan for the rabbit pen includes the following:

- It will be in the shape of a rectangle
- It will take 24 feet of fence material to make
- Each side will be longer than 1 foot
- The length and width will measure whole feet

Part A: Draw 3 different rectangles that can each represent Mrs. McCrary's rabbit pen. Be sure to use all 24 feet of fence material for each pen.

Mrs. McCrary wants to make a rabbit pen in a section of her lawn.

What does it say?	What does it mean?	What are my math wonderings?
Mrs. McCrary		
wants to make a rabbit pen		
in a section of her lawn.		

With a Partner…

What does it say?	What does it mean?	What are my math wonderings?
Her plan for the rabbit pen includes:		
It will be in the shape of a rectangle.		
It will take 24 feet of fence materials to make.		
Each side will be longer than 1 foot.		
The length and width will measure whole feet.		

Strategy 3: Math Paired Protocol

Math Paired Conversation Protocol

PROBLEM:

Paraphrase and clarify problem for one another (in pairs)

(Talk about what is asked; what is given; what happens; what is and isn't important; what the units are, etc.)

☐ ***TALK***

Estimate the answer

(Each partner generate and justify your own estimate; then compare them)

☐ ***TALK***

METHOD A *(name it)*	Justify method ☐ ***TALK***	**METHOD B** *(name it)*	Justify method ☐ ***TALK***
Can use visuals, drawings, charts, tables, graphs, symbols, equations, units, etc.	Argue & Justify what you do ☐ ***TALK***	Can use visuals, drawings, charts, tables, graphs, symbols, equations, units, etc.	Argue & Justify what you do ☐ ***TALK***

Practice

17

Mr. Garcia asks his students to find a fraction that meets these conditions.

- The fraction is greater than $\frac{1}{2}$.
- The fraction is less than $\frac{4}{5}$.

Create a fraction that meets Mr. Garcia's conditions.

Language of Justification

Students use the **language of justification** to give reasons for an action, decision, point of view, or to convince others.

- I believe this because …
- I think _____ because…
- My primary reason for thinking this is….

3 Actions to Support ELLs

1. **Mathematical Discourse-** Toolkit
2. **Unpacking Word Problems**
3. **Classroom Conversation-** Math Paired Protocol

- Why would these strategies benefit ELLs and ALL of our learners?
- Which strategy would be most beneficial in your context and why?

iTeachELLs Modules

This suite of modules highlights why teachers need to rethink the role of language in instruction and explores ways to modify lessons to address the needs of ELL students. *An overview of this suite of modules is provided here:* Modules Overview

ELLs & Disciplinary Discourse

Teachers need to adapt lesson plans to ensure all students understand the content.

Metacognitive/Metalanguage

ELLs need to understand words and meanings in order to grasp content.

Content Language Objective

Teachers must create lessons that not only present content but also teach the language needed.

Primary Language Support

It is important to treat students' native language as a resource rather than a hindrance.

Assessment

Standardized tests aren't the most effective way to guage ELLs knowledge or abilities.

PBL into PBELL

Students should work collaboratively to research a meaningful problem and develop solutions.

https://education.asu.edu/iteachells/

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