



**ELL and  
Numeracy:  
Let's Roll  
up Our  
Sleeves**

**COABE 2015  
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# Objectives



- Consider and provide feedback on a proposed model for the Adult Numeracy Teacher Knowledge Base.
- Identify their own areas of strength and growth regarding numeracy for non-native speakers of English.
- Gain 3-4 specific teaching strategies for the adult numeracy classroom.

# Why talk about math + language?

A thin wire, 20 centimeters long, is formed into a rectangle. If the width of this rectangle is 4 centimeters, what is the length?

# Why talk about math + language?

The word "wire" becomes a rectangle


A lengthy modifier in an unusual position. Usually modifiers go BEFORE nouns in English. 20-cm long modifier is after the noun wire.

Passive Voice Construction. Not all passive voice can be turned into active. In math and science, the agent is often missing. .

"A thin wire, 20 centimeters long, is formed into a rectangle. If the width of this rectangle is 4 centimeters, what is the length?"

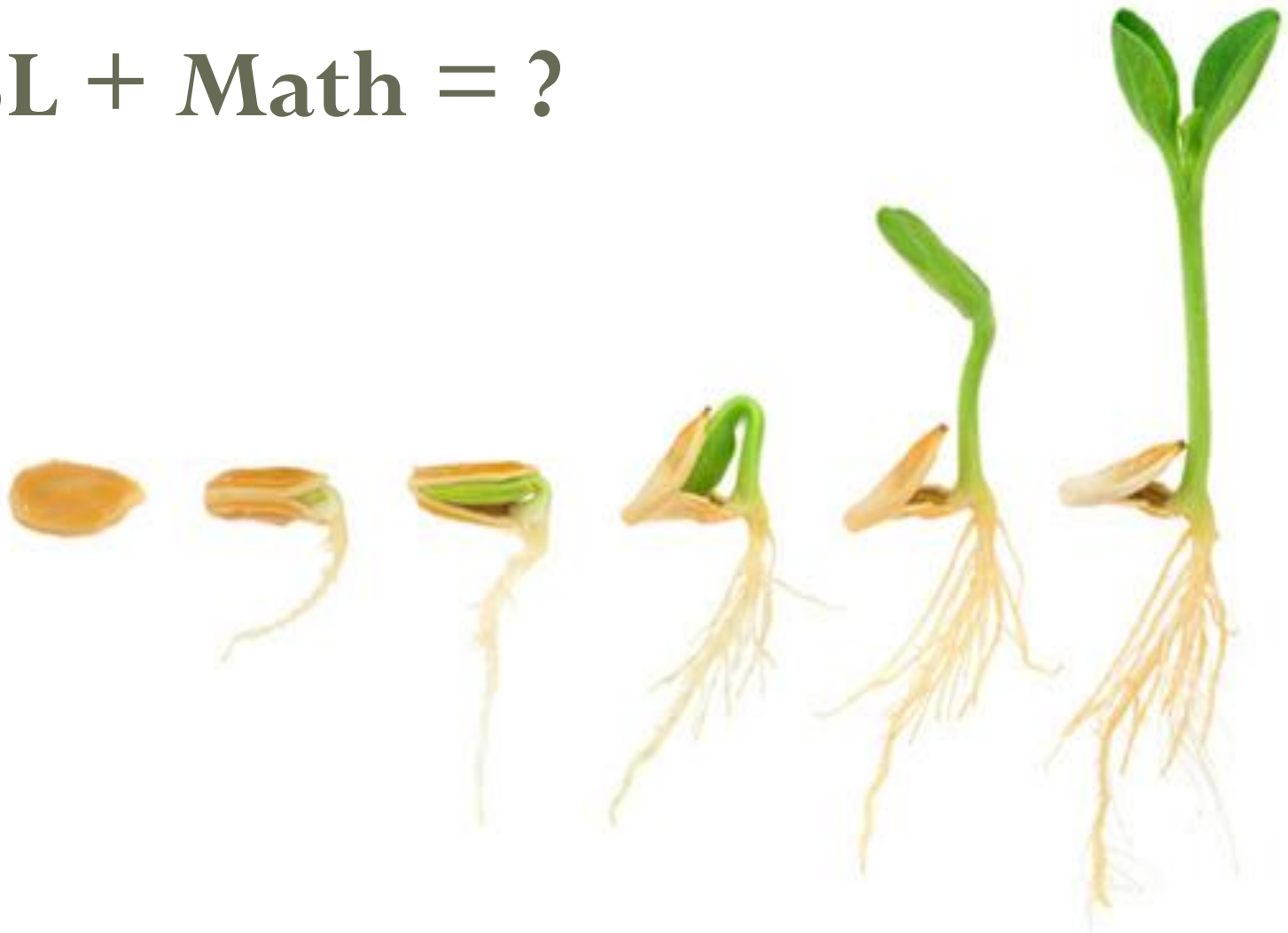
A complex sentence with a conditional clause starting with the "If"

The words width and lengths are nominals. Students know adjectives wide and long. Nominals are challenging because they contain concepts

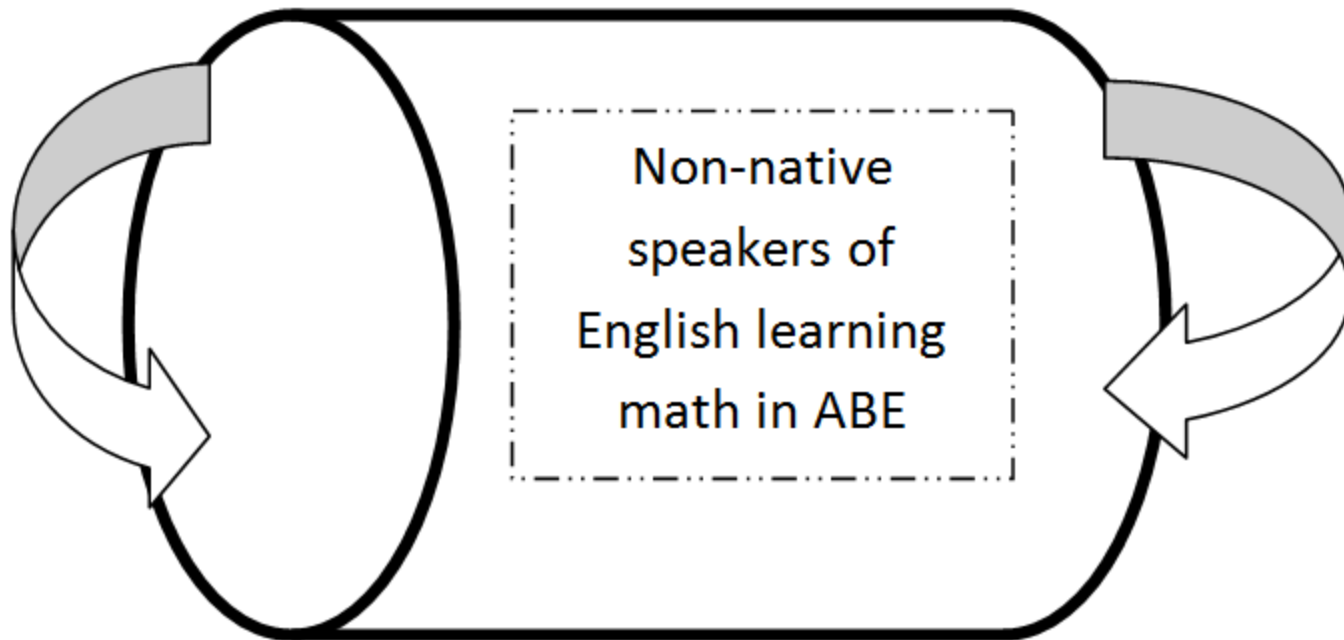
A wooden pier made of planks extends from the bottom left towards the top right of the frame. The pier is surrounded by a body of water with a greenish-blue tint. The lighting is dramatic, with strong highlights on the pier and deep shadows in the water. The overall mood is contemplative and mysterious.

How did we  
get here?

**ESL + Math = ?**



# ESL & ABE/GED teachers approach math differently



Teach math more  
**conceptually**

Teach math more  
**contextually**

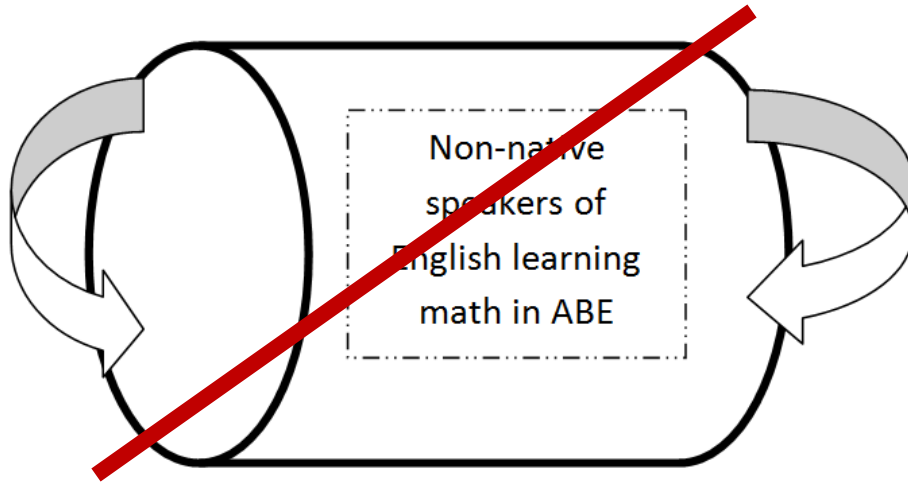
**But it's  
complicated...**







# ESL & Math Meeting of the Minds



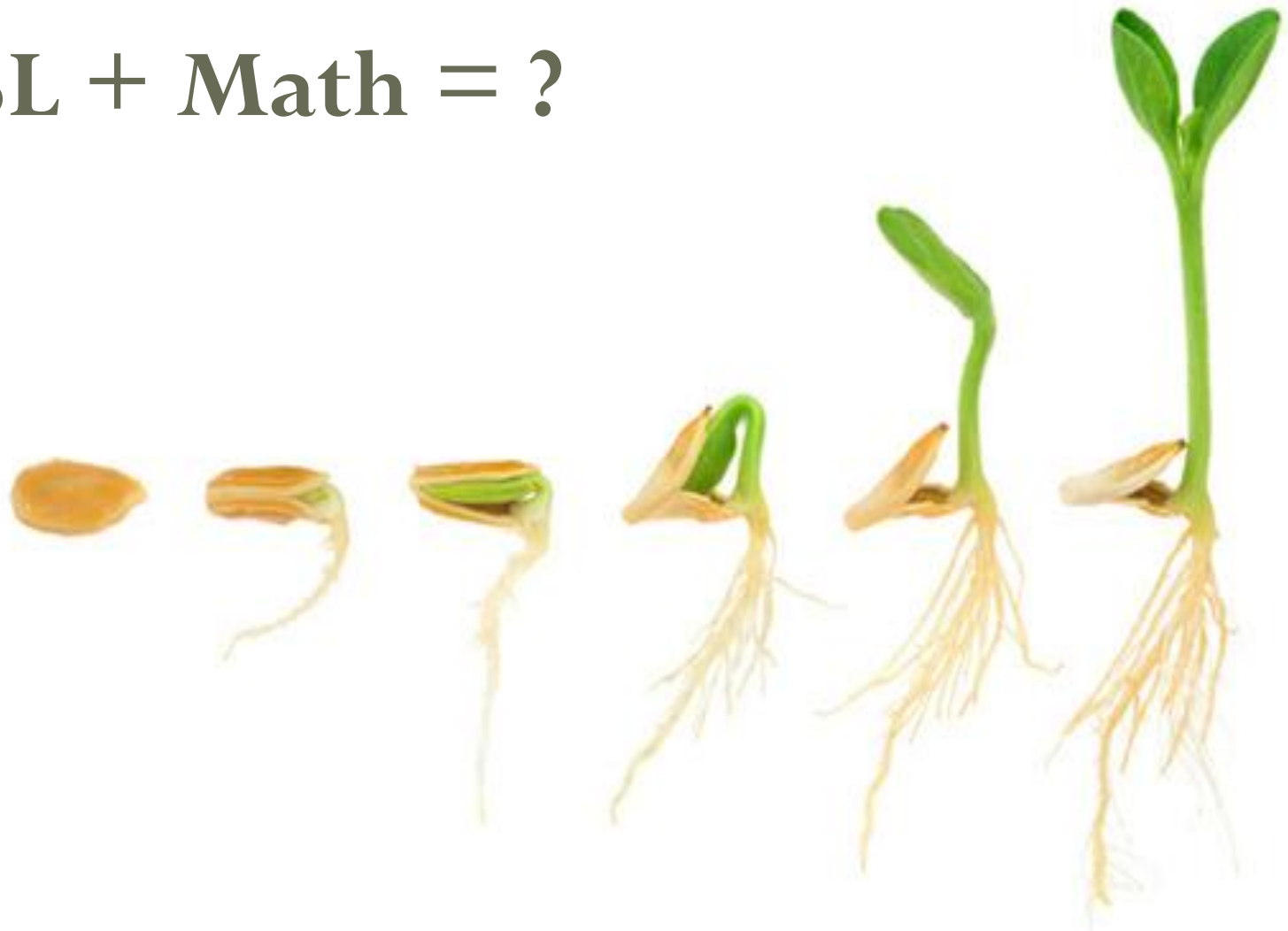
**“Crushing the can”  
of the dichotomy of  
differing ESL/ ABE  
approaches to math  
instruction**

**Quiz!**



**KEEP  
CALM  
IT'S  
ONLY A  
QUIZ**

**ESL + Math = ?**



“We need to do both: build students complex language as we augment how we assess higher-order thinking and conceptual understanding.”

(Zweirs, O’Hara, & Pritchard, 2014)

**Examples:**

- Incorporate CCR practices and standards
- Apply levels of knowing
- Apply depth of knowledge
- Sequence math instruction
- Assess student math proficiency

**Math Pedagogy**

*Do I know how to build and deliver effective math units and lessons?*

**Examples:**

- Hold deep conceptual understanding of math
- Have confidence in own math knowledge
- Be willing to access resources, seek clarification, and learn along with students as needed.

**Math Content**

*Am I comfortable with the math I am teaching on a deep conceptual level?*

**Examples:**

- Set language objectives provide language support
- Break down complex language and explain relationships of words and structures

**Language Pedagogy**

*Do I understand and support my students' language challenges around math?*

**Examples:**

***Understand impact of and respond to -***

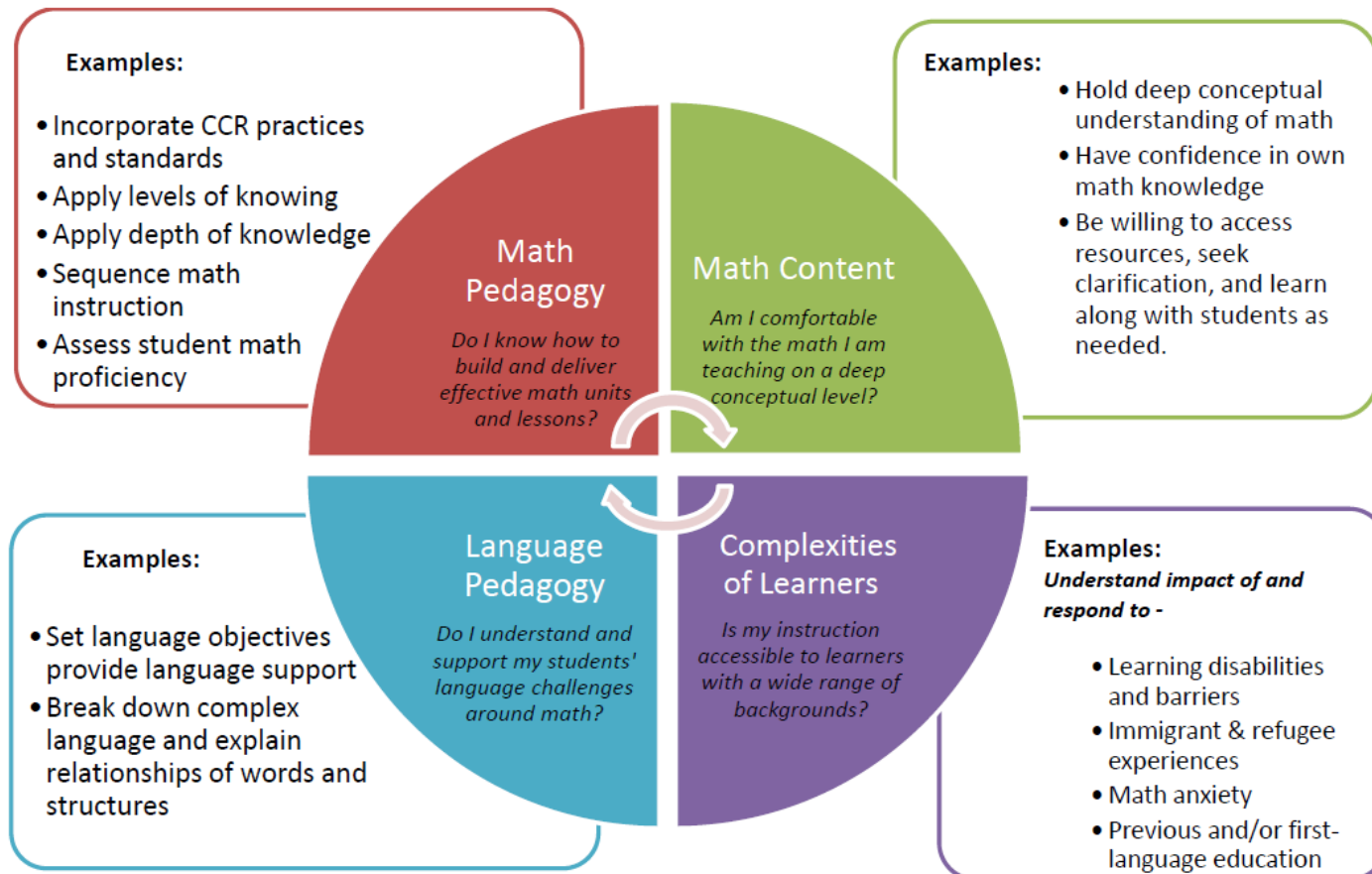
- Learning disabilities and barriers
- Immigrant & refugee experiences
- Math anxiety
- Previous and/or first-language education

**Complexities of Learners**

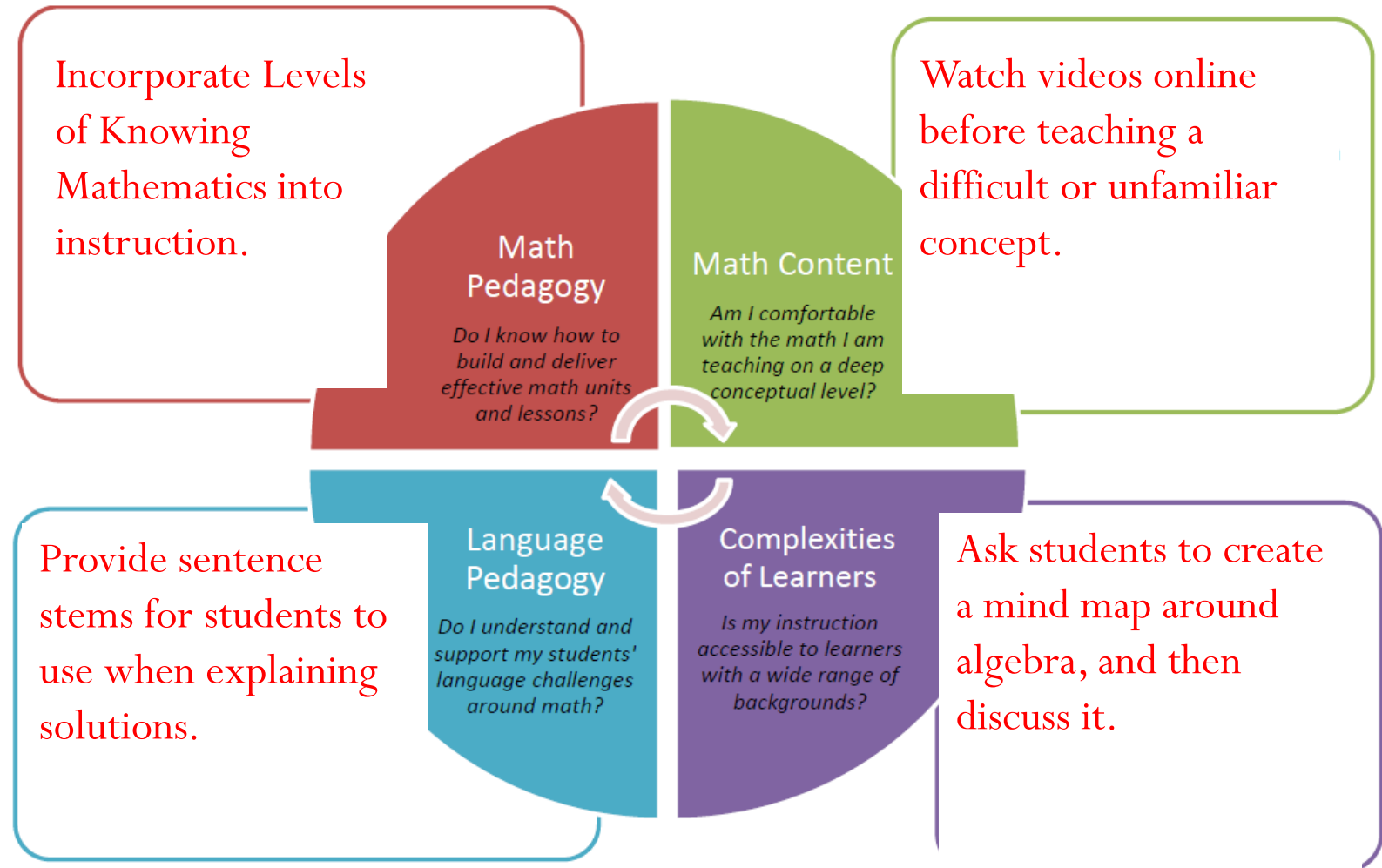
*Is my instruction accessible to learners with a wide range of backgrounds?*

# Teacher Knowledge Base: a Model

- What are your areas of strength and growth?
- What resonates with you about this model?



# Strengthening Each Quadrant





“Teachers need to know the language that is running the learning show in each lesson.

The more we develop students’ language and literacy skills needed for learning, the better all students will learn the content in enduring ways. And vice versa.”

(Zweirs, O’Hara, & Pritchard, 2014)

A piece of brown paper with a white string tied in a knot on the left side. The string is wrapped around the paper in a cross pattern, with a knot on the left side. The text is written in a white, serif font on the right side of the paper.

Questions?  
Comments?  
Resources

# References

- Westerlund, R. (2015). The Language of Tests. *Reclaiming the Language of Social Justice Blog*. Available: <https://reclaimingthelanguage.wordpress.com/2015/02/01/the-language-of-tests/>
- Zwiers, J., O'Hara, S., & Pritchard, R. (2013). *Eight Essential Shifts for Teaching New Standards to Academic English Learners*. Stanford University: Academic Language Development Network. Available: [www.aldnetwork.org/news/eight-essential-shifts-teaching-new-standards-academic-english-learners](http://www.aldnetwork.org/news/eight-essential-shifts-teaching-new-standards-academic-english-learners)