



## Integrating Language and Mathematics: Principles and Tools for Elementary Teachers and Students

Promising Math Conference Erikson Institute Early Math Collaborative October 13-14, 2017

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ESOL Enrollment Data as of August 29, 2017	ESOL Student Data
TOTAL ESOL POPULATION: <b>24,445</b>	LANGUAGES COUNTRIES ~130
ELEMENTARY K-5 15,657 MIDDLE 6-8 3,329 HIGH 9-12 5,459	COUNTRY OF BIRTH UNITED STATES (61%) EL SALVADOR (19%) GUATEMALA (5%) HONDURAS (4%) AFGHANISTAN (1%)

## Questions for the Early Childhood Community

### **Big Ideas of Early Mathematics with English Learners:**

- 1. What do teachers of young English learners need to **know**?
- 2. What **actions** do teachers of young English learners need to undertake when teaching mathematics?
- 3. What **professional development** structures need to be put in place to support teachers of young English learners?

## **Session Agenda**

- UMD-PGCPS District Partnership: PD Initiatives
- Integrating Language and Mathematics
  - Principles That Guide Our Collaborative Work
  - Classroom Applications: Instructional Tools
- Implications for Early Childhood
- Closure and Questions

**Session Outcomes**: Participants will leave with actionable takeaways for addressing ELs' needs in early childhood mathematics.

## The Changing Landscape for Teaching Mathematics

- Growing numbers of English learners in public schools
- CCSS: Mathematical Content AND Practices
- WIDA Language Development Standards
  - ESOL teachers support language development (L, S, R, W) in ALL content areas, <u>including mathematics</u>
- Teachers of Mathematics = Teachers of Language of Mathematics

Focus on promoting student discourse for both mathematics AND language development!

### **OVERLAPPING KNOWLEDGE FOR TEACHING MATHEMATICS TO ENGLISH LANGUAGE LEARNERS**

#### Mathematics Education/CCSS

Discourse in Mathematics & the Language of Mathematics

WIDA ELD Standards

Teaching and Learning of Mathematics -Content & Pedagogy

English Language Acquisition & English Learners

## **PGCPS & UMD Partnership**



## **Principles That Guide Our Collaborative Work**

Mathematics Education/CCSS Discourse in Mathematics & the Language of Mathematics

WIDA ELD Standards

Teaching and Learning of Mathematics -Content & Pedagogy

English Language Acquisition & English Learners

<u>Recurring Question</u>: How does this inform early childhood mathematics with English learners?

CCSS Mathematical Practice (What STUDENTS Do)	NCTM Mathematics Teaching Practices (What TEACHERS Do)
1) Make sense of problems and persevere in solving them*	Establish mathematics goals to focus learning
2) Reason abstractly and quantitatively	Implement tasks that promote reasoning and problem solving*
3) Construct viable arguments and critique the reasoning of others*	Use and connect mathematical representations*
4) Model with mathematics*	Facilitate meaningful mathematical discourse*
5) Use appropriate tools strategically	Pose purposeful questions*
6) Attend to precision*	Build procedural fluency from conceptual understanding
7) Look for and make use of structure	Support productive struggle in learning mathematics
8) Look for and express regularity in repeated reasoning	Elicit and use evidence of student thinking

## What Does This Look Like in Early Childhood? NCTM & NAEYC Position Statement

NATIONAL COUNCIL OF TEACHERS OF MATHEMATICS

naeyc

EXECUTIVE SUMMARY Early Childhood Mathematics: Promoting Good Beginnings A joint position of the National Association for the Education of Young Children (NAEYC) and the National Council of Teachers of Mathematics (NCTM)

#### Position

The National Council of Teachers of Mathematics and the National Association for the Education of Young Children affirm that high-quality, challenging, and accessible mathematics education for threeto-in:xyear-old-hildren is a vital foundation for future mathematics learning. In every early childhood setting, children should experience effective, research-based curriculum and teaching practices. Such high-quality practice in turn requires policies, organizational supports, and adequate resources that enable teachers to do this challenging and important work.

#### Rationale

As a society, we are becoming more aware of the importance of early experience in learning to read and write. A similar awareness with respect to mathematics is circical. Early childhood mathematics has a growing knowledge base about learning and hasching as well as an expanding array of research-based curriculum resources. Teachers are eager to provide young children with good beginnings. Now professional preparation programs, education agencies, policymakers, and other patterns must mobilize the commitment and resources to apply what we know, support teachers' work, and generate significant progress in early childhood mathematics.

#### Recommendations

In high-quality mathematics education for three-to-six-year-old children, teachers and other key professionals should

- enhance children's natural interest in mathematics and their disposition to use it to make sense of their physical and social worlds;
- build on children's varying experiences, including their family, linguistic, and cultural backgrounds; their individual approaches to learning; and their informal knowledge;
- base mathematics curriculum and teaching practices on current knowledge of young children's cognitive, linguistic, physical, and social-emotional development;
- use curriculum and teaching practices that strengthen children's problem-solving and reasoning
  processes as well as representing, communicating, and connecting mathematical ideas;
- ensure that the curriculum is coherent and compatible with known relationships and sequences of important mathematical ideas;
- provide for children's deep and sustained interaction with key mathematical ideas;
   integrate mathematics with other activities and other activities with mathematics;
- integrate mathematics with other activities and other activities with mathematics;
   provide ample time, materials, and teacher support for children to engage in play, a context in which they explore and manipulate mathematical ideas with keen interest;
- actively introduce mathematical concepts, methods, and language through a range of appropriate experiences and teaching strategies;
- support children's learning by thoughtfully and continually assessing all children's mathematical knowledge, skills, and strategies.

To support high-quality mathematics education, institutions, program developers, and policymakers should

- create more effective early childhood teacher preparation and continuing professional development in mathematics;
- use collaborative processes to develop well-aligned systems of appropriate, high-quality standards, mathematics curriculum, and assessment;
- design institutional structures and policies that support teachers' mathematics learning, teamwork, and planning;
- provide resources necessary to overcome the barriers to young children's mathematical proficiency at the classroom, community, institutional, and system-wide levels.

This position is elaborated in the full version of the joint statement at www.nasyc.org/resources/position statements/positions intro.htm

- Hopefully this isn't new to you and it is already informing early childhood instruction
- Important to consider implications for ELs

### **Reflection/Discussion Prompt**

- Which of these 10 recommendations should be highlighted for ELs?
- Where should we place emphasis when "promoting good beginnings" for ELs?



Standard 1: Social and Instructional Language Standard 2: The Language of Language Arts Standard 3: The Language of Mathematics Standard 4: The Language of Social Studies Standard 4: Language of Science

English language learners communicate information, ideas, and concepts necessary for academic success in the content area of mathematics.

# WIDA Early English Language Development Early Years: 2.5 - 4.5

Standard 1: Social and Emotional Language Standard 2: The Language of Early Language **Development & Literacy Standard 3: The Language of Mathematics Standard 4: The Language of Social Studies Standard 5: The Language of Science Standard 6: The Language of Physical Development** www.wida.us



## The Language of Mathematics Defining Features (PreK-12)

Vocabulary: everyday words academic words mathematics terms

> Word/Phrase Level

## Language Forms & Conventions:

language structures, singular & plural nouns, parts of speech, syntax

Sentence Level

Linguistic Complexity: extended & logically connected utterances of speech (oral & written)

Discourse Level

Listening, Speaking, Reading, Writing

Modified by Galina (Halla) Jmourko from The Defining Features of the Academic Language in WIDA's Standards, WIDA Consortium, Draft, 2011

## WIDA The Language of Mathematics Defining Features (Early Years: 2.5-4.5)

#### Language Usage:

children's developing sense of semantics, syntax, & pragmatics

#### Linguistic Complexity: children's variety &

length of utterances

Listening & Speaking

Modified by Galina (Halla) Jmourko from The Performance Definitions of The WIDA Early English Language Development Standards, Ages 2.5–5.5, 2014 Edition



## Guiding Principles of Language Development (LD)

First languages, **Cultures**, Life **Experiences** Context Language -Content Connection



Supports

Meaningful Interaction

Listening, Speaking, Reading, & Writing

Social, Instructional, & Academic Language

## **WIDA Early Years** Guiding Principles of Language Development (LD)

#### WIDA Early Years Guiding Principles of Language Development

- Dual language learners are learning more than one language at the same time and adjust the use of their languages to different sociocultural contexts. (Adv. 2007; Bidayouk; 2010; Connau, Generee, & Mendelon, 2007; Edelsky & Jilbert, 1985; Connew, Bovia, & Nicolaida, & Grandin, & Parisdi, 1985;
- Dual language learners learn language and culture through their experiences at home, in the community, and in carty care and education. (Bonnis, 2012; Culture & Guine, 20
- The languages and language varieties used by dual language learners and their families are valuable resources to be considered and incorporated into early care and education and into everyday routines and activities. (huysus, Catro, & Peisner-Feiberg, 2010; Castor, Eginosa, Panz, 2011; Colina, 2010; Favret, Longen, Eppe, 2009; Castra, 2010; Genziate, Moll, & Amani, 2005; Heng, 2011; Lange-Ners, Jackson, & Goldstein, 2010; Michael-Luna, 2013; Michael-Luna, 2015; Napvi, McKcough, Thome, & Pfinisher, 2012; Revej, Da Silva, & Faller, 2016; Nore & Stein, 2013)
- Dual language learners benefit from continuous home language development at all levels of English language development. (Montelongo, Hernato, 2011; Price, 2007; Restrop, Castila, Schwanenflugel, Neuharth Prichett, Hamilton, & Arboleda, 2016; Neufragez, 2010; Neutraz, 2014; Simon-Cereijdo & Guiterze-Ciellen, 2016)
- 5. Dual language learners follow different paths for language development than monolingual learners. (Andruski, Casielle, & Geoff, 2014; Białystok, 2007; Davidan, Raschike, & Pervez, 2010; De Houver, Homstein, & De Conser, 2006; Dickinson, McCahe, Clark-Cianell, & Wolf, 2014; Dodds, A. Lan, 2008; Habino-Smith & Colsident, 2010; Buinor, Meina, Maguatt, 2009; Himms-Edds, 2011; Manova & Genetee, 2002; Nicoladis & Marchak, 2011; Nicoladis, Pilaner, Microi, & Wyang, Tayang, and Sharaka, 2011; Nicoladis, 2014; Holden, Smith, 2011; Nicoladis, Pilaner, Microi, & Wang, A. Korei, 1959)
- 6. Dual language learners follow unique parts of language development according to their exposure to and opportunities for using their multiple languages. (Banex, Yarox, Urons, Jung, & Blans, 2007). Evidower, 2009. Genexe, 2001; Genexe, 2010; Ginese, 2010; Ginese,
- Dual language learners approach learning language in different ways, with each learner bringing a unique set of attitudes, habits, and preferences for language use. Bisnovy 6 burnesd, 2013; Chestrield, Chestrield, 64, ohres, 1982; Chestrield, Hyse-Latimer, Barrows & Clavez, 1982; McDermott, Rikon, & Fantuzzo, 2014; Fiker, 2013; Rikon, McDermott, & Fantuzzo, 2014; Fiker, 2013; Rikon, McDermott, &
- Dual language learners, like other children, develop language through play-based activities that invite rich language interaction. (Iell, Greendel, Bubdox)-Starener, & Curre. 2016; Honowa A. Leone, 2007; Bubdoxy-Sheere, BuR, Romero, & Carter, 2012; Cohen, Kramer-Vida, Pyre, & Andreso, 2014; Huerta & Riojae-Corter, 2014; Kenitah, 2007; Piker, 2015; Riojae-Corter, 2000; Riojae-Corter, 2001)
- Dual language learners are developing language and literacy at the same time that they are also developing physically, cognitively, socially, and emotionally. (Burst, Biystok, Caroto, & Sanchez, 2014; Bialystok, 2009; Bialystok, & Marin, 2004; Biali, Whitaker, Zopak, Bottaherg, Achtensor, et al., 2014; Jondan-DeCarbo & Gailliotz, 2014; Bialystok, Zopak, Biystok, Gandes-Sesse & Li, 2011; Okanda, Koriguchi, et lakum, 2010; Vygoziv, 1986; Winsier, Burchinal, Tien, Peinner-Feinber, Expinos, et al., 2014; Winsler, Ferrybongh, & Montez, 2009; Winsier, Kim, & Kichand, 2014; Yang, Yang, & Liano, Zio 111; Yazoima & Feinser-Feinberg, 2009)
- 10. Dual language learners' development of social and developmentally appropriate academic language is a complex and long-term process. (Almin, 2013; Gorá & Ponier, 2013; Gorc, Ponier, & Sembiane, 2012; Hakana, Buler, Goro, & Witt, 2000; Levis, Sandola, Hammer, Sowye, & Mondez, Jolfe Hamer, Marien, Matous, & Herdenson, 2014; Schöffer Hammer, Hoff, Uchicobi, Gillanders, Castro, & Sandilos, 2014; Tsybina, Girolametro, Weitzman, & Greenberg, 2006; van Kleeck, 2014; Walab, Sanchez, & Buraham, 2010;

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### **Reflective Questions:**

- How do these documents affirm and challenge your approaches/practices in the early childhood classroom?
- What 2-3 Principles will guide your work moving forward? Why?

## **WIDA Early Years** Guiding Principles of Language Development (LD)

#### WIDA Early Years Guiding Principles of Language Development

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- Dual language learners learn language and culture through their experiences at home, in the community, and in carty care and education. (Bonnis, 2012; Culture & Guine, 20
- The languages and language varieties used by dual language learners and their families are valuable resources to be considered and incorporated into early care and education and into everyday routines and activities. (huysus, Catro, & Peisner-Feiberg, 2010; Castor, Eginosa, Panz, 2011; Colina, 2010; Favret, Longen, Eppe, 2009; Castra, 2010; Genziate, Moll, & Amani, 2005; Heng, 2011; Lange-Ners, Jackson, & Goldstein, 2010; Michael-Luna, 2013; Michael-Luna, 2015; Napvi, McKcough, Thome, & Pfinisher, 2012; Revej, Da Silva, & Faller, 2016; Nore & Stein, 2013)
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- Dual language learners approach learning language in different ways, with each learner bringing a unique set of attitudes, habits, and preferences for language use. (Baroody & Diamond, 2013; Chesterfield, Chesterfield, & Chavez, 1982; Chesterfield, Hiyes-Latimer, Barrows & Chavez, 1983; McDernott, Rikoon, & Fantuzzo, 2014; Piker, 2013; Rikoon, McDernott, & Fantuzzo, 2012)
- Dual language learners, like other children, develop language through play-based activities that invite rich language interaction. (Bell, Greenfield, Bulotsky-Shearer, & Carter, 2016; Bodrowa & Leong, 2007; Bulotsky-Shearer, Bell, Romero, & Carter, 2012; Casha, Kramer-Vida, Fye, & Andreou, 2014; Huera & Riojas-Cortez, 2014; Konishi, 2007; Piker, 2013; Riojas-Cortez, 2000; Riojas-Cortez, 2001)
- Dual language learners are developing language and literacy at the same time that they are also developing physically, cognitively, socially, and emotionally. (Bare, Bialysok, Catro, & Sachez, 2014; Bialysok, 2009; Bialysok, & Marin, 2004; Bialy Whitek, Zapode, Botcheze, Asdeven, et al. 2014; Acoub-Cacha & Galliota-Colls Les, 1904; Oude-Sees & Li, 2011; Okanda, Koriguchi, el Jakum, 2010; Vygoziv, 1986; Winsier, Buechnah, Tien, Peinner-Feinber, Egations, et al., 2014; Acoub-Sees & Li, 2011; Okanda, Moriguchi, el Jakum, 2010; Vygoziv, 1986; Winsier, Buechnah, Tien, Peinner-Feinber, Egations, et al., 2014; Acoub Ferrybough, & Montenz, 2009; Winsier, Marc & Mindu, 2014; Yang, Yang, & Lison-Feinber, 2011; Yazoima & Feinser-Feinber, 2009)
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### Key Points:

- Developmental considerations
   Simultaneous learning of home language
   (L1) AND of English as a new language (ENL)
- Role of (L1), culture, and experiences as valuable resources
- Different language learning paths of L1 and of ENL
- Role of play and meaningful interaction

## What Does Integrated Instruction Look Like?





## Guiding Principles of Language Development (LD)





**Supports** 

Meaningful Interaction

Listening, Speaking, Reading, & Writing

Social, Instructional, & Academic Language

### Integrated Approach to Mathematics - Language Teaching and Learning



## Language Development Supports for ELLs to Increase Comprehension and Communication

Environment			
<ul> <li>Welcoming and stress-free</li> <li>Respectful of linguistic and cultural diversity</li> <li>Honors students' background knowledge</li> <li>Sets clear and high expectations</li> <li>Includes routines and norms</li> <li>Is thinking-focused vs. answer-seeking</li> <li>Offers multiple modalities to engage in content learning and to demonstrate understanding</li> <li>Includes explicit instruction of specific language targets</li> <li>Provides participation techniques to include all learners</li> </ul>	<ul> <li>Integrates learning centers and games in a meaningful way</li> <li>Provides opportunities to practice and refine receptive and productive skills in English as a new language</li> <li>Integrates meaning and purposeful tasks/activities that:         <ul> <li>Are accessible by all students through multiple entry points</li> <li>Are relevant to students' lives and cultural experiences</li> <li>Build on prior mathematical learning</li> <li>Demonstrate high cognitive demand</li> <li>Offer multiple strategies for solutions</li> <li>Allow for a language learning experience in addition to content</li> </ul> </li> </ul>		

Sensory Supports*	Graphic Supports*	Interactive Supports*	Verbal and Textual Supports	
<ul> <li>Real-life objects (realia) or concrete objects</li> <li>Physical models</li> <li>Manipulatives</li> <li>Pictures &amp; photographs</li> <li>Visual representations or models such as diagrams or drawings</li> <li>Videos &amp; films</li> <li>Newspap ers or magazines</li> <li>Gestures</li> <li>Physical movements</li> <li>Music &amp; songs</li> </ul>	<ul> <li>Graphs</li> <li>Charts</li> <li>Timelines</li> <li>Number lines</li> <li>Graphic organizers</li> <li>Graphing paper</li> </ul>	<ul> <li>In a whole group</li> <li>In a small group</li> <li>With a partner such as <i>Turn-and-Talk</i></li> <li>In pairs as a group (first, two pairs work independently, then they form a group of four)</li> <li>In triads</li> <li>Cooperative learning structures such as <i>Think-Pair-Share</i></li> <li>Interactive websites or software</li> <li>With a mentor or coach</li> </ul>	<ul> <li>Labeling</li> <li>Students' native language</li> <li>Modeling</li> <li>Repetitions</li> <li>Paraphrasing</li> <li>Summarizing</li> <li>Guiding questions</li> <li>Clarifying questions</li> <li>Probing questions</li> <li>Leveled questions such as What? When? Where? How? Why?</li> <li>Questioning prompts&amp; cues</li> <li>Word Banks</li> <li>Sentence starters</li> <li>Sentence frames</li> <li>Discussion frames</li> <li>Talk moves, including Wait Time</li> </ul>	

## **Exploration of Instructional Tools**

#### **Cubing Game**



### Three-Way Tie



#### 2x2 Sentence Builders



### **Problem-Solution Space**

My PT	oblem-Solution Space
Names	Date:
I am learning how to make sense of a math proble	em and how to make a convincing argument about my solution.
<ol> <li>Purporting or realities realities is provided to the second of the second</li></ol>	0 Use much over the architem.
	Writeyour answer is complete sestence.     Use qualified information or examples from the problem to any out your same     solution of the sestence of th



## Cubing Game: Looking at a Concept from Different Perspectives

#### Define



#### Compare Contrast



PERIMETER & AREA

What is the perimeter of the red shape? What is the perimeter of the group shape? What is the perimeter of the groon shape? What is the perimeter of the blue shape?



**Connect/Associate** 



Apply



### Three Way Tie

Let's Investigate And Prove The Connections!



# 2x2 or 3x3 Sentence Builders



# 2x2 or 3x3 Sentence Builders

We are learning about <u>Odimensional shapes</u>. Here are the words I know and use when I talk about <u>These</u> Shapes







I can use these words to create at least 3 different sentences. the cone are different because. faces. Cube and the e'('nne has are same nacause

Name	Date
Name:	Date:
I am learning how to make sense of a math probl	<b>em</b> and how to <b>make a convincing argument</b> about my solution.
<b>Paraphrase</b> or retell the problem in your own words. Create and label a <b>visual model to represent</b> the problem and the solution.	◊ Use numbers to solve the problem.
	<ul> <li>Write your answer in complete sentences.</li> <li>Use specific information or examples from the problem to support your answer</li> <li>Apply what you know mathematically to make a convincing argument about yo solution.</li> </ul>

# **Problem – Solution Space**

Paraphrase or restate the math problem in your own words.

Ture

Sketch the problem and the solution

◊ Paraphrase or restate the math problem in your own words. ◊ Sketch the problem and the solution. How many cardinals there is going be in saturday. 2.5,4,7.6.9 Rule: add 3 Subtra

Math Problem and Solution Name:

Paraphrase or restate the math problem Write th in your own words. Sketch the problem and the solution. Rule blue Jon's, Monday condinals on, Tu He Javes, 7 condinals, DC-DOND, 9 cardinals, 50

# **Tracking Classroom Implementation:**

Teacher Journaling

Reflecting on Teaching Practices Rationale	Teacher:		
Math Strengths/Challenges:	Language Strength/Challenges:	Participation/Attitudes/Motivation:	

Observations and Impacts		
	Students	Attitudes/Feelings/Motivation
	I noticed that my student (s)	I noticed that my students
Knowledge, Skills, Thinking, Communication	Ms. PB: "I didn" my kids can ta	't know Ik like
nguage visity	that!"	
Vocabulary Usa Control, Linguist		
	H Vocabulary Usa, mguage Knowledge, Shills, Thinhing, Control, Linguist, velexity Communication	Students I noticed that my student (s) MS. PB: "I didn my kids can ta my kids can ta that!"

	CCSS Mathematical Practice (What STUDENTS Do)	NCTM Mathematics Teaching Practices (What TEACHERS Do)
5	1) Make sense of problems and persevere in solving them*	Establish mathematics goals to focus learning
	2) Reason abstractly and quantitatively	Implement tasks that promote reasoning and problem solving
7	3) Construct viable arguments and critique the reasoning of others*	Use and connect mathematical representations*
5	4) Model with mathematics*	Facilitate meaningful mathematical discourse*
	5) Use appropriate tools strategically	Pose purposeful questions*
7	6) Attend to precision*	Build procedural fluency from conceptual understanding
	7) Look for and make use of structure	Support productive struggle in learning mathematics
	8) Look for and express regularity in repeated reasoning	Elicit and use evidence of student thinking

Z

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## **Instructional Tools: Take-Aways**

- Have explicit language focus (vocabulary, sentences) AND support development of mathematical ideas
- Integrate multiple ways to support language and mathematics learning (visual, graphic, interactive)
- Offer ways to differentiate support for ELs of varying language skills (word level, sentence level, discourse level)
- Offer multiple ways for formative assessments (language AND mathematics)
- Create opportunities to practice CC Mathematical Practices AND L/S/R/W

**NOTE:** Because these are "non-traditional" ways of engaging students in mathematics, it is important to strategically coordinate the use of **Tools** with appropriate mathematical **Tasks**.

## What Does It Look Like in the Early Childhood Classroom with Young ELs?





Considering NAEYC, NCTM, & WIDA, reflect on the following questions:

- How might these instructional tools that promote mathematics and language integration and foster literacy and discourse - look in the early childhood classroom?
- 2. What specific **modifications** might be necessary to support young ELs in the early childhood classroom?
- 3. What early childhood classroom **experiences** would prepare ELs for the type of integrated elementary instruction we have described?

### Mathematics - English Learners - Early Childhood Our Take-Aways

- Language-Rich Environment
  - Teachers' attention to students' receptive understanding
  - Teachers' attention to **nonverbal** cues of students' thinking
  - Some explicit instruction **targeting** specific language features
- Integrating Mathematics into Activities and Play
  - Not always "Math Block"
- Context and Shared Experiences
  - Literature, play, manipulatives, classroom routines, school events
- Developmentally **Appropriate** Instructional Tools
  - Reading/Writing → Representing/Modeling (not just numbers)
  - Translation/Cognates → Concept Attainment

## Questions for the Early Childhood Community

### **Big Ideas of Early Mathematics with English Learners:**

- 1. What do teachers of young English learners need to **know**?
- 2. What **actions** do teachers of young English learners need to undertake when teaching mathematics?
- 3. What **professional development** structures need to be put in place to support teachers of young English learners?

# Resources

- TODOS-math.org
- NCTM:
  - Mathematics for ALL Principles to Actions
  - Access and Equity: Promoting High Quality Mathematics
  - Beyond Good Teaching
  - Eyes on Math
- TESOL
- Intentional Talk







**Big Ideas of** 

Early

**Mathematics** 

What Teachers of Young Children Need to Know

The Early Math Collaborative Erikson Institute

Anthony Farm





# **THANK YOU!**

Feel free to contact us for more information, resources, etc.

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