

Opening & Reflection

Nevada Early Childhood Leadership Series

Session 2

Session Objectives

- Preview the scope of work for the day
- Reflect on the impact that the Vision of Excellent Instruction is having in their centers
- Share successes and challenges around sharing their updated Vision of Excellence with teachers

- ICE BREAKER -

What is something people can't tell just by looking at you or listening to you speak?



Table Reflection and Discussion

- How did you have teachers develop their own classroom-level visions? (What setting? What format? What activities or strategies did you use?)
- What went well? What was challenging? How did you address the challenges?

Group brainstorm ways to address outstanding challenges moving forward.

Tracker System

Nevada Early Childhood Leadership Series

Session 2



NAEYC Video on Math Talk

- Why is it so urgent that our children are exposed to rich and varied vocabulary in math?
- What are you and your teachers already doing to promote language acquisition in math for your children? Where do you wish you were doing more?

Building Math Skills - Promoting Math Talk in the Classroom

Nevada Early Childhood Leadership Series

Session 2

Objectives

- Explain why math talk is essential to young children's future math success
- Describe the principles of using math talk in birth through five-year-old classrooms
- *Understand the trajectory of oral language and math development as outlined in the research, the Infant and Toddler Early Learning Guidelines, and the Pre-Kindergarten Standards*
- Plan for common opportunities to utilize math talk throughout the day

Agenda

Opening

Introduction to Math Talk

Connecting to the Standards

Application: Practice and Planning

Closing



NAEYC Video on Math Talk

- Why is it so urgent that our children are exposed to rich and varied vocabulary in math?
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What are your reactions/responses to the summary of this study below?

"A Developmental Psych study examined the relation between the amount of mathematical input in the speech of preschool or day-care teachers and the growth of children's conventional mathematical knowledge over the school year. Three main findings emerged.

- First, there were marked individual differences in children's conventional mathematical knowledge by 4 years of age that were associated with socioeconomic status.
- Second, there were dramatic differences in the amount of math-related talk teachers provided.
- Third, and most important, **the amount of teachers' math-related talk was significantly related to the growth of preschoolers' conventional mathematical knowledge over the school year but was unrelated to their math knowledge at the start of the school year."**



What is Math Talk?

- Math talk is as simple as it sounds: **talking with children about the math they experience.**
- The goal of math talk is to **keep the child talking**—this looks different dependent on a child’s age. For infants, you may be modeling this for them (we know their receptive language is high!). For toddlers and older children, you may be asking questions to keep the conversation going and to support them in verbalizing their thinking.
- Math talk is used to help children to **communicate their thinking** and **justify solutions to problems** they solve mentally.

Key Idea: Math talk needs to be intentionally incorporated into classroom interactions—no matter the setting or “subject”—but it doesn’t require a giant lesson plan! This should feel natural and intuitive; the more you do it, the more natural it will become.

As we watch [this video](#) about math talk in a preschool setting, watch **how the teacher infuses math talk** into her classroom.

- What math talk do you notice educators or children using?
- What other math talk opportunities do you see?
- What math skills are being built into these opportunities?

MATH TALK LOOK FORs

Infused Throughout the Day

Takes advantage of opportunities that exist: routines such as attendance, lunch distribution, store center (counting money), building center (size and shapes), etc.

Continues the Conversation

Keep the child talking by asking questions, prompting, and more

Uses Appropriately Complex Math Vocabulary

Tier 2 vocabulary
Children communicate accurately and confidently

Promote Problem-Solving and Process, not just Skill

It's not just about vocabulary development or getting the right answer
Children explain their thinking and the process/approach they take

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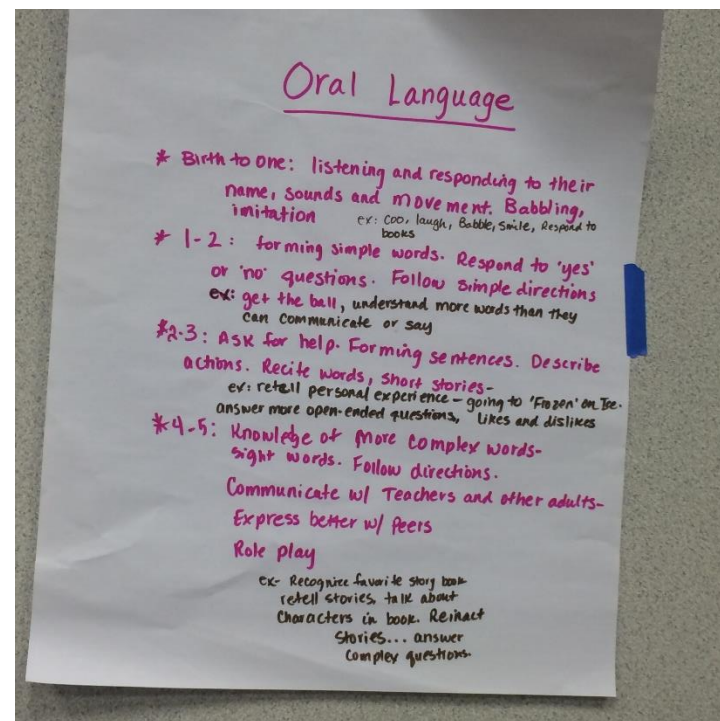
Application: Practice and Planning

Closing

Returning to Standards and Developmental Trajectories

Key Idea: Students develop along predictable trajectories, more or less hitting milestones in a specific order and in specific age ranges. The Infant and Toddler Early Learning Guidelines and Pre-Kindergarten Standards are built to address the major developmental milestones that children should hit each year.

Content Standard 1.0: Numbers, Number Sense & Computation		
Indicator M= Math	Examples: Children will/may...	Supportive Practice: Practitioner/Adult will...
→ 1.PK.3a Recognize and read numerals 0-5.	Identify numbers and match number symbols 0 to 5.	Consistently provide materials to promote counting.
→ 1.K.3 Recognize, read, and write numbers from 0-10.	Compare snack with a friend and recognize that they have the same amount. Identify and match the number to a group of objects.	Provide children with opportunities to match object with numbers.
1.PK.3b Estimate the number of objects in a set of 5 and verify by counting.	Identify the next number in a series of numbers up to 5.	Encourage children to experiment with counting.
1.PK.3c Match the number of objects in a set to the correct numeral 0 to 5.	Identify the concepts of "more than, less than" when comparing two groups of objects.	Sing songs that encourage counting.
1.K.3 Match the number of objects in a set to the correct numeral 0 to 10. Recognize relationships of more than, less than, and equal to.	Count familiar objects or manipulatives in the classroom.	Model counting of objects.
1.PK.4a Count to 10.	Count each object once (e.g., one-to-one correspondence).	Provide many opportunities throughout the day for counting concrete objects.
1.PK.4b Count to 10 by demonstrating one to one correspondence using objects.	Identify and name numbers in signs or books.	Ask children to answer the question, "how many?" in relation to various concrete objects.
1.K.4 Count to 20 by demonstrating one-to-one correspondence using objects.	Put red, yellow, and blue objects together and count them.	Play counting games.
1.PK.5 Use concrete objects to combine and separate groups up to 5.	Participate in finger plays, such as "Five Little Monkeys," that require counting backwards.	Read books that feature counting or numbers.
1.K.5 Use concrete objects to model simple addition and subtraction.		Model the connection between a counting word/number and an object.



Flag pages (standards)

Infant and Toddler Early Learning Standards for Math

pages 15, 16, 19, 23, 24, 29, 30, 36, 37, 46, 47, 56, 57, 58, 68, 69

Pre-K Standards for Math

Pre-K: 23-26 Science 27-31

Connecting Oral Language Standards to Math Standards

Directions

1. Spend a few minutes **connecting the oral language (Pre-K pgs. 39-40) standards to the math standards and in particular consider the concepts of more or less, spatial reasoning, and counting** in the Infant and Toddler Guidelines and the Pre-Kindergarten Standards.
 - **Infant/Toddler pgs. 14, 18, 22, 23, 28, 29, 34, 35, 44. 45, 53-55, 64-67**
2. **Highlight any math standards** you notice that pertain specifically to vocabulary acquisition and development across the ages.
3. **Note any specific milestones** that children will hit at each age (relating specifically to oral language and vocabulary and math) in your handouts. *Remember: We will have time to dig in here later, so focus on steps 1-2.*

Agenda

Opening

Introduction to Math Talk

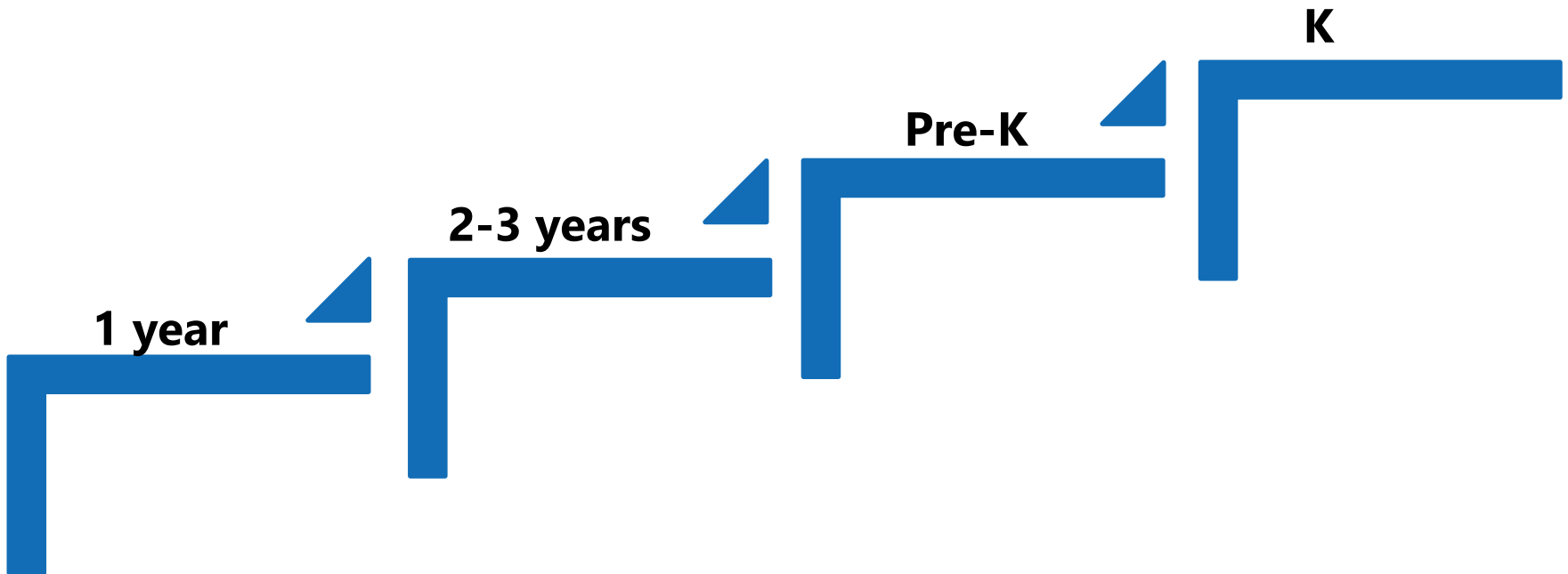
Connecting to the Standards

Application: Practice and Planning

Closing

Key Idea: Over time, the language we use for math talk will become more intuitive and natural. Planning and practicing math talk will help us get there, especially as we consider how math talk may look/sound different with each developmental step children take.

Example: Counting/Number Sense
What does math talk sound/look like at each age for this concept?



What does math talk sound/look like at each age for this concept?

1-year: When a teacher hides their face behind their hands and says, "One, two, three, *peek-a-boo!*" a baby learns to anticipate seeing the teacher's face as a result of the counting (even as an infant).

2-3 years: As you are passing out snacks, you say, "Let's count the apples! I see one apple! OH! I see another! That is two! Do you see another in our snack basket?"

A mother cooking with her child says, "How many more times do I need to stir the brownies?" and then "OK, I stirred them five times. How many more times do I need to stir?"

What does math talk sound/look like at each age for this concept?

Preschoolers: The key here is to engage in *discussion*, not rapid fire question and answer sessions. Preschoolers need time to work out the problem on their own. Soon they will begin asking *you* questions. Even wrong answers provide opportunities.

Example: A child comes into school and says three plus three is five. The teacher says, "Show me how you calculated your answer. Did you count?" The child then may use their fingers and count aloud "See, 3—1, 2, 3, plus two more fingers, 1, 2 is 1, 2, 3, 4, 5" to work through what they are learning.

Kindergarten and older: Ask older children to help with the math that we encounter in everyday situations. A teacher might ask children for help with counting how many pencils there are in the classroom and ask them how they could figure it out. This might involve having each table count up their pencils and then asking the class to help her add up the numbers. Presenting these problems in a way that has children take the lead and discuss with each other different ways to approach the solution (and to do the math!) builds math talk in our older learners.

Plan

- **Imagine** you are popping into a two- or three-year-old classroom during center time. Students are engaged in **a blocks center, a library center, and a science center.**
- Write **one sentence you could use and one question you could ask of children in each center that would increase math talk.**

Practice

- With the person sitting next to you, **practice delivering your sentence and question** as though one of you is the leader and the other is the child.
- **If you are the leader,** you will practice delivering your sentence or question to your "child" as though you are in the centers. **If you are the child,** you will silently pretend to be playing and working alongside the leader.

Feedback

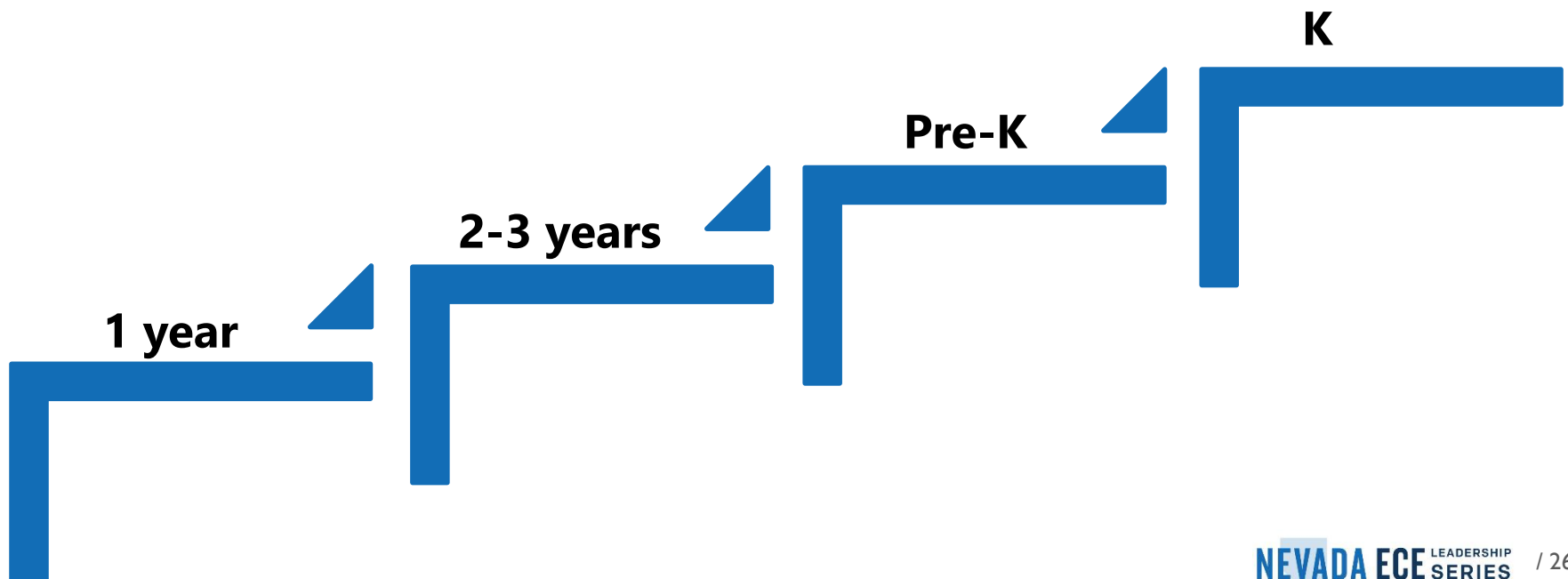
- After the leader practices their sentence and question, the child will **provide feedback (one glow, one grow) to the leader** using the math-talk cheat sheets.
- After providing feedback, the roles will switch and the other partner will become the leader.

More or Less

Key Idea: In New Zealand, more or less is referred to as pre-counting (which also includes “same” and an appreciation of how all 3 are related).

Example: *Will feeds Maya, his 8-month-old daughter. He pauses for a moment and Maya signs “more.” Will laughs. “You want more? Okay, here it comes!” When the bowl is empty, Will says and signs, “All gone. Maya ate her food. All gone.” Maya looks at him and smiles.*

What does it sound/look like at each age?

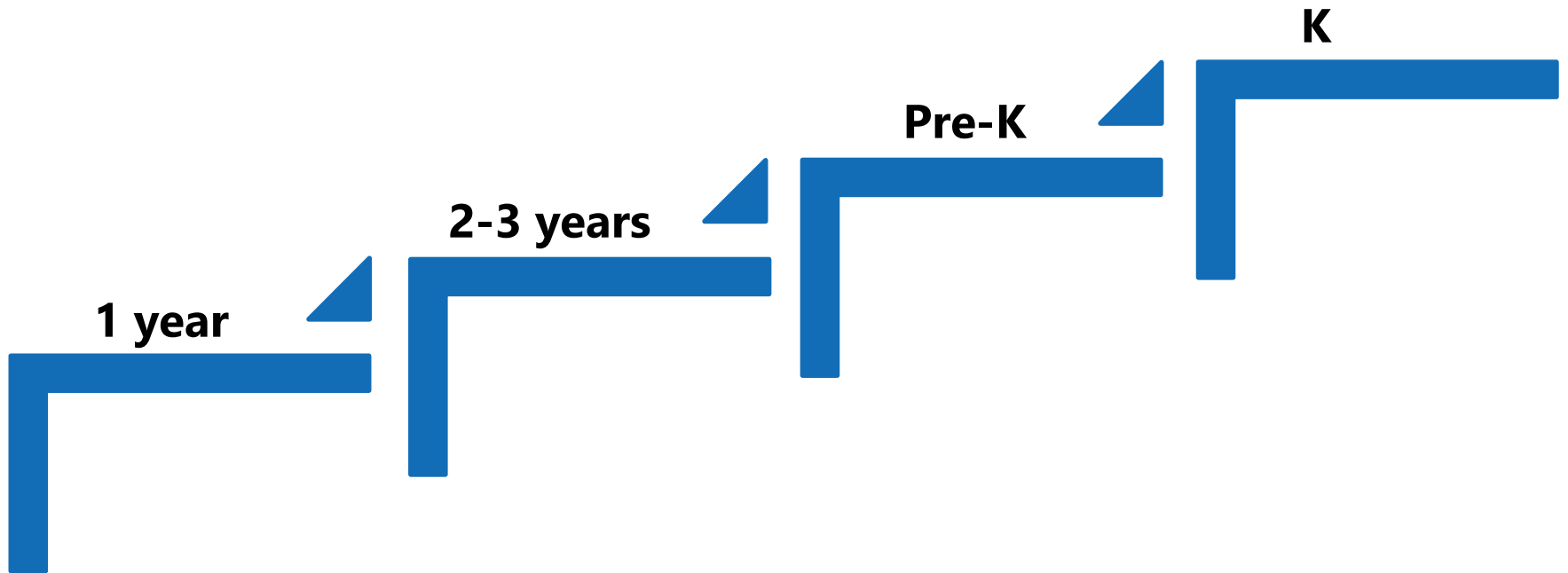


Spatial Relationships

Key Idea: Spatial relationships refers to understanding the physical relationship between yourself and other objects and the relationships between objects.

Example: "Look, Jason went *under* the climber and Aliyah is on *top*!"
"You're sitting *next to* your brother."

What does it sound/look like at each age?



It's time to **PRACTICE!**

Plan

- **The purpose of this practice and planning is for you to think about math talk specifically in line with the concepts we just covered: more/less and spatial reasoning.**
- Write **one sentence you could use and one question you could ask of children for each concept** (you'll have 4 total—2 for more/less, 2 for spatial reasoning)

Practice

- With the person sitting next to you, **practice delivering your sentence and question** as though one of you is the leader and the other is the child.
- **If you are the leader**, you will practice delivering your sentence or question to your "child" as though you are in the centers. **If you are the child**, you will silently pretend to be playing and working alongside the leader.

Feedback

- After the leader practices their sentence and question, the child will **provide feedback (one glow, one grow) to the leader** using the math-talk cheat sheets.
- After providing feedback, the roles will switch and the other partner will become the leader.

Reflecting on Practice

Put your leader hat back on. Discuss the following questions with your group:

- How could this quick practice activity support your teachers in gaining comfort and confidence using math talk?
- How can teachers apply math talk immediately without feeling like they have an “added” task on their to-do list? What message do you want them to walk away with in terms of its quick and easy application?
- How (if at all) do you need to re-invest your teachers in continuing with active practice?
- If you are an ELIS: How can you help your leaders as they think through and plan for the above?

Agenda

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Application: Practice and Planning

Closing



Take the next several minutes to create a plan for how you will take this content back to your team.

- When will you deliver this content to your staff? (**Remember:** we expect you to share this content by the Session 4 Math training.)
- How will you deliver content to your staff? (One whole-group two-hour professional development? Smaller groups? Smaller chunks of time? Direct facilitation vs. small group planning?)
- How will you support your team in implementing math talk? What tools will you create and provide them with?
- What challenges do you anticipate your staff may have with this content?



The questions below are for when you facilitate for your staff:

What are your next steps for ensuring that you are constantly and intentionally exposing your children to language via math talk?

When and where will you increase your use of math talk? How will you hold yourself accountable for using these strategies?

What questions do you still have about what you learned today?

What feedback do you have about the session for the facilitator?

Next Steps for Teachers

- Draft sentence starters that will help you remember to use math talk strategies daily. Post these prompts around your classroom strategically.
- Select and post 10-15 complex math vocabulary words that you want to emphasize over the next month.
 - Have your prompts and vocabulary posted by **PROVIDE DATE.**

Break 😊





Reflect on your experience observing classrooms.

What do you listen for to know that what's occurring is high quality?

How do you ensure you are collecting evidence of what you are seeing and hearing in classrooms?

Practice: Observing for Math Talk

Nevada Early Childhood Leadership Series

Session 2

Objectives

- Develop a high-level understanding of the math observation rubric
- Identify key look-fors of strong math language development in a classroom
- Observe an ECE math lesson and take low-inference notes on evidence of math talk using the math observation rubric

Agenda

Opening

Introduction: Math Rubric

Digging Into the Rubric: Math Language Development

Practice Observation Using the Rubric

Closing

Introduction to the Rubric

- The observation tool for math looks very similar to that for literacy, though it has 4 competencies instead of 3.
 - Essential Content
 - Math Language Development
 - Owning the Learning
 - Integrated, Cohesive Learning
- Each competency has indicators that you'll rate individually and then use them and the guiding question to help you arrive at your overall rating.

Agenda

Opening

Introduction: Math Rubric

Digging In to the Rubric: Math Language Development

Practice Observation Using the Rubric

Closing

Digging in to the Rubric: Math Talk



Take **5 minutes** to:

- Highlight and annotate the Math Language Development Competency in a way that helps you.
- What do you notice is similar to the Language and Literacy tool?
- What questions do you have?
- What is helpful? What might be challenging to rate?

Agenda

Opening

Introduction: Math Rubric

Digging In to the Rubric: Math Language Development

Practice Observation Using the Rubric

Closing

The purpose of this practice for you to have an opportunity to practice observing for math talk so that you can more nimbly do so in your own center/school.

Practice Steps:

- o Watch [the video clip](#) and collect data focused on the **Math Language Development competency in the rubric** for teacher and child actions.
- o You'll reflect and respond in three ways – first independently, then in pairs, and lastly summarizing our analysis whole group.

How to Rate Overall Performance

1. Decide on your rating for each indicator.
2. Consider the ratings for all the indicators under a particular competency (i.e.. Math Language Development).
3. Using your evidence and indicator ratings, assign an overall rating to that competency: Ineffective, Approaching Developing, Developing, Proficient.
4. Write 2-3 evidence statements that support your overall rating.
5. Repeat for each relevant competency.

Take 2 minutes to look for trends in your notes.

1. How would you rate what we observed on the rubric? Does this teacher's instruction exemplify what we identified as critical for math talk?
2. What is emerging to you as a primary area of development? (*You don't have to fully commit to your area of development quite yet - more evidence is coming!*)

Take 3 minutes to reflect in pairs.

- Compare evidence you collected. Do your notes look similar?
- What was difficult about collecting evidence this way? Easy?
- Share your thinking about an area of development for this teacher.



Be prepared to share out your responses with the group.



Let's take a few minute to reflect on our practice

1) Reflection Questions:

1. What did you find came naturally to you during this observation?
2. What did you find challenging?
3. What do you need to do as a leader to be ready to conduct these observations?

2) Facilitator Feedback

Agenda

Opening

Introduction: Math Rubric

Digging In to the Rubric: Math Language Development

Practice Observation Using the Rubric

Closing



- When are **3** different times of day you expect to see math talk (give an example of what it might sound like!)?
- What are **2** next steps you will take as a leader to ensure you are making time for observing math talk in your center/school? (If you are an ELIS: What are **2** next steps you will take to ensure leaders make time for observing math talk in their weekly schedules?)
- What is **1** reason you would share with someone for why math talk is critical for children? (Imagine you have a teacher or parent who is not invested or seeing the rationale for why math talk is critical.)

Closing and Reflection

Nevada Early Childhood Leadership Series

Session 2

Session Objectives

- Reflect on key concepts learned during the day and revise their visions to reflect that
- Articulate the next steps to take prior to the next session (including completing this session with teachers and observing for math talk throughout the day)
- Provide feedback on the day's session

Agenda

Revisiting Your Vision

Looking Ahead to Our Next Session: Next Steps

Feedback Survey

Revisiting Your Vision

Today we dug deeply into what math talk looks like in early childhood classrooms and centers.

Take out your vision from our last session together and look to see how/if math talk is present. Based on what we discussed and practiced today, revise your vision to reflect your deeper understanding of math talk and your learnings from today. ELISs: Please circulate to your leaders to support them as they revise.

Agenda

Revisiting Your Vision

Looking Ahead to Our Next Session: Next Steps

Feedback Survey

Looking Ahead to Our Next Session

Teacher Content: Number Sense

We'll look at how our youngest learners build and develop number sense, what teachers do intentionally to make this possible, and practice using these skills ourselves.

Leadership Skills:

Observing a classroom for evidence of number sense using key look fors in line with our vision.

Next Steps

Prior to our next Math training:

Teacher Observations:

- Conduct at least 3 teacher observations using the Math Talk Look-Fors. Observe teachers during any time of the day to get an understanding of if/when/how math language is being used in their classroom.

Building Math Talk:

- Implement the teacher training content on Math Talk with at least one small group of teachers (approximately 5 teachers) prior to the **Session 4** training. (Note that this gives you two months to implement.)
- Collect exit tickets at the end of the Math Talk training session and bring those with you to the Session 4 training.
- Before and after the training: Observe a small group of teachers who will participate in the training (3-5) to assess if and how math talk is being implemented in their classrooms before and after the training you provide.

Ongoing:

Teacher Observations:

- Prioritize time in your schedule to conduct observations of teachers each week. Enter those teachers' **math** ratings into the observation tracker.

Agenda

Revisiting Your Vision

Looking Ahead to Our Next Session: Next Steps

Feedback Survey

Providing Feedback

**Please take the next five minutes to complete
feedback survey for today's sessions.**