This guide gives suggestions for presenting the Math Matters: Recommendations and Research PowerPoint presentation. Use this for a quick overview of the “big ideas” in young children’s math learning and key teaching practices to support children’s early Mathematics Knowledge & Skills. Show the presentation to teachers or adapt it for other uses.

**SLIDE 1:**
MATH MATTERS: RECOMMENDATIONS AND RESEARCH

**SLIDE 2–4:**
CHILDREN ARE NATURAL MATHEMATICIANS!

**What to know**
Infants from one day to several months old know the difference between a set of two objects and a set of three.

**What to say**
Math learning begins in infancy and continues for the rest of our lives!

**What to do**
Read through these three slides.

**References**

SLIDE 5 & 6:
MATH CONCEPTS AND SKILLS

What to know
The “big ideas of mathematics” are “overarching clusters and concepts and skills that are mathematically central and coherent, consistent with children’s thinking, and generative of future learning” (Clements and Sarama, 2009).

What to say
According to the National Council of Teachers of Mathematics (NCTM), there are three “big ideas of mathematics,” which are Number and Operations, Geometry, and Measurement, with Algebra and Data Analysis and Probability playing supporting roles. These “big ideas” are similar to the Mathematics Knowledge & Skills domain elements in the Head Start Child Development and Early Learning Framework (HSCDELF), which are Number Concepts & Quantities, Number Relationships & Operations, Geometry & Spatial Sense, Patterns, and Measurement & Comparison.

What to do
Read through these slides.

References
SO, WHY DOES EARLY MATH MATTER?

What to know

Mastering foundational mathematics skills early on contributes to children’s ongoing process of understanding deeper and more complex mathematics (Baroody, 2004).

Also, Duncan and colleagues (2007) found that when children enter kindergarten:

- Their mathematics skills mattered the most for predicting later math achievement up to grade 3.
- Their entering math skills were predictive of both math and reading skills up to grade 3.
- Their beginning reading skills predicted later reading, but they did not predict later math skills.

What to say

We might think of early math skills as a “two-for-one” investment since early math has an impact on outcomes across multiple domains of learning. This is not to diminish the importance of learning in other critical areas, such as literacy and social-emotional skills, but to recognize the need to bring mathematics into balance with them.

What to do

Read through the slide and the above comments. Then ask teachers/participants what they think of these research findings.

References


SLIDE 8: BUT THERE ARE CHALLENGES TO EARLY MATH LEARNING

What to know
This is a transition slide.

What to say
Even though we know that early mathematics is really important, there are also some challenges to math learning. We can see the path, but there’s something in the way! What could it be?

What to do
Ask participants to share some challenges they might have experienced.

Some possible answers include: too little time, too many curriculum areas, or not enough math knowledge.
SLIDE 9:
WHAT DOES THE CHALLENGE LOOK LIKE IN CLASSROOMS?

What to know
This research comes from two studies examining pre-kindergarten programs.

What to say
Findings from the National Center for Early Development and Learning’s Multi-State Study (2005) showed that the average amount of time focused on math content was 8%, compared to language and literacy at 14%.

Another study by Early and colleagues (2010) that examined how children spent time in preschool found that children spent about 8% of their day in mathematics, 17% of the day in literacy activities, and about 44% of the day in no specific learning activity.

Results from these studies also showed that math learning tended to focus on discrete skills or factual knowledge rather than conversation, problem-solving, or interactive learning.

Taken together, we’re getting the picture that not nearly enough math is happening. So, what does this mean for young children’s math learning?

References

**SLIDE 10:**
A FUZZY PICTURE

*What to say*

One challenge is that math is often not a big FOCUS of early learning activities. Here is a picture that gives us some information, but none of it in clear focus. We get a general idea about what this child is doing, and what he might be learning at this moment, but we are unable to see specific details about his experience. From the research, we know that this is how mathematics, and other content-specific domains, are often thought about in classrooms. They are general and somewhat fuzzy or unspecific.

**SLIDE 11:**
A MORE FOCUSED APPROACH

*What to say*

We want to move practice to a more focused approach where intentional and specific teaching helps children build content-specific skills, a change that has been called for by the Advisory Committee on Head Start Research and Evaluation: Final Report (2012). The advisory committee made two recommendations relevant to our discussion today.

- The first is to increase “supportive and stimulating interactions that provide a foundation *for content-specific curricula* and implement content-specific, evidence-based curricula.”

- The second recommendation is that those content areas that previously received less attention (and as a result, lower child outcomes), now become a greater priority.

Among those content areas are:

- Mathematics
- Science
- Vocabulary

**References**

**SLIDE 12: SUPPORTING EARLY MATH**

**What to know**
The next four slides introduce teachers to specific practices they can do to support early math learners.

**What to say**
But the good news is, we can make a difference! We are going to see some simple ways to increase math learning. But first, what are you already doing?

**What to do**
Ask participants how they are now supporting math learning. You may want to write their ideas down on a poster paper.

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**SLIDE 13: SUPPORTING YOUNG MATHEMATICIANS: MATHEMATIZE!**

**What to say**
Mathematize means bringing out the math in what children are doing. Adults can mathematize children’s experiences by using mathematical language in everyday conversations, making comments, asking and answering questions, and posing problems.

**What to do**
Ask participants to provide examples of mathematical concepts and words for this activity. For example, number concepts: counting five steps; geometry: spatial concepts (moving hand up or down, stepping backward); measurement and comparison: size of shadow (longer, shorter).
**SLIDE 14: SUPPORTING YOUNG MATHEMATICIANS: PROVIDE MATERIALS!**

**What to say**

Carefully select materials that support mathematical learning goals. Materials need to be interesting and meaningful to children and enhance their engagement in learning.

**What to do**

Ask participants to discuss what kinds of mathematical concepts children can explore using the materials in the photos. For example, using buttons, children can count, add and subtract, compare quantities, sort, classify, and create patterns. Using shapes and pegboards, younger children can explore, recognize and match shapes, and learn simple spatial concepts, such as up, down, in, and out. Older preschoolers can combine and separate shapes, describe attributes, compare sizes, and learn more complex spatial concepts, such as next to, in front of, and between.

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**SLIDE 15: SUPPORTING YOUNG MATHEMATICIANS: PROVIDE CHALLENGE!**

**What to say**

Children learn best when they are engaged in active learning where they can explore, manipulate, extend, and expand on their knowledge. Adults extend a child’s learning by observing what a child already knows and is able to do and providing a slightly more challenging activity.

**What to do**

Ask participants to identify what kinds of mathematical concepts the two children in this picture are working on (measuring, looking at objects increasing in size under the microscope). Then ask for ideas about ways the teacher might extend the children’s mathematical learning, such as adding more bugs of different sizes so children can compare, sort, and order by size, and manipulating the microscope to make objects look smaller as well as bigger.
SLIDE 16:
SUPPORTING YOUNG MATHEMATICIANS: SHARE!

What to say
Tell participants that this information is just a start. Teachers need to continue to deepen their knowledge and skills on an ongoing basis: work with a mentor or peer teacher to share ideas and resources about teaching math, plan lessons, observe each other, and use resources from the Early Childhood Learning and Knowledge Center (ECLKC) website.

What to do
Have participants share with a partner one math-related activity they did in their classroom.

SLIDE 17:
CLOSING

Provide participants with NCQTL contact information and encourage them to visit our website for additional resources: http://eclkc.ohs.acf.hhs.gov/hslc/tta-system/teaching/center