Training 1. Measurement and Math Talk
Make Connections: You and Me and Math

Background for trainers

Goals

- Understand why math is important for babies, toddlers, and preschoolers
- Learn about Make Connections: You and Me and Math
- Learn about “math talk” (ways to talk with children to build their math confidence and skills)
- Recognize that young children learn about measurement by comparing sizes

Materials

- Pencils or pens, 1 per participant
- Handout 1 (1A-1G), 1 per participant, English or Spanish
- Tube pasta, 7-10 pieces per participant
- String, enough for 10-12 inches per participant
- Scissors, 1 for every 5 participants

Before beginning

- Copy handouts in color
- Set up materials for Bead Bracelet activity
- Set up projector for video (optional)

A. Welcome and introduction (5 minutes)

1. Explain session goals

Welcome! In this training you will learn:

- why math is important for babies, toddlers, and preschoolers,
- about the math program, Make Connections: You and Me and Math,
- about “math talk,” or, ways to talk with children to build their math skills and confidence,
- how young children learn about measurement.

2. Have participants discuss in pairs for 1-2 minutes

Before we begin, take a moment to think about one of your own childhood math experiences. What happened?

3. Explain why math is important for preschoolers, toddlers, and babies

Research shows that children do better in all school subjects when they start with strong math skills and positive math attitudes.
Many adults have had negative math experiences. Adult math attitudes have a big influence on children. Make Connections helps children and their caregivers develop positive attitudes toward math.

Before they start school, children should know much more than counting and shapes. They need to:

- know about patterns, measurement, and sorting;
- be familiar with math words like first, last, more, less, long, and short;
- be able to talk about how they solve problems.

Make Connections helps children develop these skills.

B. Watch and discuss video (10 minutes)

1. Introduce Bead Necklace video

   We are going to watch a video that shows how Make Connections can help children build math skills and positive attitudes.

   This video shows a mother and child making a necklace to fit a doll. It is based on a Make Connections activity (About Me unit, Bead Bracelet for ages 2 and up.)

   When you watch, think about:

   How does the mother help the child learn about measuring?

2. Watch Bead Necklace video
3. Have participants discuss in pairs for 1-2 minutes

*How does the mother help the child learn about measuring?*

4. Review key points

The mother helps the child learn about measuring in several ways:

- She helps the child compare sizes.
- She talks about sizes when she and her child are making a necklace. They don’t need a special math time.
- She asks open-ended questions such as, “How do you know?”
- She does not say if the child is right or wrong. She encourages the child to find out herself.

The video shows how children learn math with **MAKE CONNECTIONS**. Children do projects and activities that include math. Adults help them learn by asking open-ended questions like, “*How do you know* your necklace is too big for the doll?” To answer, children need to explain how they compare sizes. If they are not comparing sizes correctly, you can show how you do it and they will learn from you.

**MAKE CONNECTIONS** avoids questions with a right answer, like, “*Is your necklace too big for the doll?*” Children might answer correctly or incorrectly without understanding how to compare sizes.
C. About MAKE CONNECTIONS (5 minutes)

1. Distribute HANDOUT 1 and explain HANDOUT 1A

- YMCA programs around the U.S. use MAKE CONNECTIONS. Research shows that MAKE CONNECTIONS helps caregivers, children, and staff learn math, enjoy math, and build positive math attitudes.
- MAKE CONNECTIONS has activities for ages 0-2 and activities for ages 2 and up. The activities for 2 and up include Easy, Medium, and Hard variations.
- Each MAKE CONNECTIONS unit has a theme and a main math topic.
2. Review HANDOUTS 1B-1F

- HANDOUT 1B shows an activity for ages 2 and up from the ABOUT ME unit.

Read the yellow boxes out loud.

### Unit theme

**Bead Bracelet**

<table>
<thead>
<tr>
<th>Where’s the Math?</th>
<th>Math vocabulary</th>
<th>Math topic</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Around</td>
<td>• Recognize sizes such as small and large</td>
</tr>
<tr>
<td></td>
<td>• Large</td>
<td>• Use string to measure length</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>What You Need</th>
<th>Per child</th>
<th>To share</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Beads</td>
<td>5–7 long beads or pieces of tube pasta</td>
<td>• Ball of string, enough for 8–10 inches per child</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>What to Do</th>
<th></th>
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<tbody>
<tr>
<td><strong>1.</strong> Measure and cut</td>
<td>An adult cuts string a few inches longer than the child’s wrist.</td>
</tr>
<tr>
<td><strong>2.</strong> Make your bracelet and predict</td>
<td>Tie a knot around the first bead to hold it in place. String the rest of your beads.</td>
</tr>
</tbody>
</table>

**Math vocabulary**

When you do the activity, use these math words with children.

**Math topic**

Each activity addresses an important math topic.

**Talk About**

When you do the activity, use these conversation starters to help children learn math.

**Try this at home**

These are versions of the activity to do at home. Caregivers can use the same Talk About at home.

**Try this at home**

Family bracelets. Use beads, pasta, or cut-up straws. Make bracelets the right size for family members, dolls, and stuffed animals.
Handout 1C shows an activity for children under 2, from the About Me unit.

Math topic:
Each page addresses an important math topic.

Math vocabulary:
When you do the activity, use these math words with children.

Materials:
Several boxes and small plastic containers, large cardboard box open at each end.

What Fits?

Have your baby explore the boxes and containers.

See if your hand fits inside the cereal box.

Let’s find a box too small for your hand.

Encourage your baby to crawl through the “tunnel.”

You fit inside!

Tell Staff:
Each unit includes four pages of activities for children under 2. Use them in order.

Give caregivers a color copy of each page to take home.

For ELR, use one page per week.

Math talk:
When you do the activity, use these italicized conversation starters to help babies learn math.
**Handout 1D** is one of the nine Storytime Connections. It gives ideas for math talk to use when you read aloud to children. This one involves sequences (first, second, next, last). You can use it with almost any book.

Each Storytime Connection includes a page of related “math talk” to use throughout the day. **Handout 1E** shows everyday math talk about sequences.

**Tell Staff**

Use each Storytime Connection several times per year, with different books. The book listed is an example. Pick books children will love!

Give caregivers a color copy of each Storytime Connection to take home. Show caregivers how to use it when you read aloud in circle time.

**Tell Staff**

Post one per center each month. Use them in order.

Print them at full size or half size in color, two per page.

**Make Connections** includes math activities for each of 15 activity centers—for instance, literacy, fine motor, science, opening, and closing circle. Center activities are based on a number and shape of the month. **Handout 1F** shows a math activity for the dramatic play center.
D. Activity: BEAD BRACELET (10 minutes)

1. Introduce BEAD BRACELET and HANDOUT 1G
   - You will do the activity, BEAD BRACELET, on HANDOUT 1A in pairs.
     
     Read BEAD BRACELET steps 1-3 out loud. Read the Talk Abouts out loud or ask for volunteers to do so.
   - As you do the activity, practice saying the Talk About math talk.
   - Then, come up with more math talk for the activity. Fill in the sentence starters on HANDOUT 1G. Make sure your ideas fit the math talk checklists.
     
     Read HANDOUT 1G out loud, including the math talk checklists.

   - Math talk questions don’t have a right answer. If you ask questions with a right answer, children rely on you to tell them if they are right. If you ask them to explain their thinking, they figure out math ideas for themselves. Even if they can’t explain their ideas well, they will still be thinking.
   - Math talk comments are a way for you to explain your math thinking and to help children become familiar with math vocabulary.

2. Participants do the activity and fill out HANDOUT 1G
   - Show participants the materials to use. As participants do the activity, circulate to help them see if their ideas fit the math talk checklists. Help them revise if needed.

E. Wrap Up (2-5 minutes)

1. Review key points of the session
   - To review, here are the main points of the session:
     
     Math is important for babies, toddlers, and preschoolers.
     Math for young children includes measuring by comparing sizes.
     Math can be part of play.
     Math talk helps children learn math and develop positive attitudes. Math talk questions ask the child to explain thinking. Math talk comments are a way for you to explain your thinking and to help children become familiar with math vocabulary.

TELL STAFF
If you have questions, write to makeconnections@terc.edu.
Training 1. Measurement and Math Talk

**WHERE’S THE MATH?**

**①** To share

**②** Hard.

Put 12 letters on the plate.

Put 8 letters on the plate.

**③** Medium.

- **Tub of foam letters**
- **Paper plate**

**Play**

Take turns. On your turn:

- **About**

**Week 1**

**About Me / See How I Grow**

- **Try this at home**

**WHAT FITS?**

Have your baby explore the boxes and containers.

See if your hand fits inside the cereal box.

Let’s find a box too small for your hand.

**WHAT fits?**

Encourage your baby to explore the objects.

Your hand is bigger than the toy dog.

Your hand is smaller than your thumb.

**WHAT ARE THE MATHEMATICS?**

- **Shapes and sizes**
- **Geometry (shapes), measurement (sizes)**

**Materials:***

- Several boxes and small plastic containers, large Fisher-Price baby box at each end.

**WHAT ARE THE MATHEMATICS?**

- **Shapes and sizes**
- **Geometry (shapes), measurement (sizes)**

**Materials:***

- Two toilet paper tubes, several small plastic containers, large Fisher-Price baby box at each end.

**WHAT ARE THE MATHEMATICS?**

- **Shapes and sizes**
- **Geometry (shapes), measurement (sizes)**

**Materials:***

- Two toilet paper tubes, several small plastic containers, large Fisher-Price baby box at each end.
### Bead Bracelet

#### Where’s the Math?

**Math vocabulary**
- Around
- Large
- Small

**Math topic**
- Measurement
  - Recognize sizes such as small and large
  - Use string to measure length

#### What You Need

**Per child**
- 5–7 long beads or pieces of tube pasta

**To share**
- Ball of string, enough for 8–10 inches per child
- Scissors (for adult)

#### What to Do

1. **Measure and cut**
   An adult cuts string a few inches longer than the child’s wrist.

2. **Make your bracelet and predict**
   Tie a knot around the first bead to hold it in place. String the rest of your beads.

   **Talk About**
   - **Easy.** Let’s see if this little bracelet fits **around** your wrist.
   - **Medium.** How do you know the bracelet will fit **around** your wrist?
   - **Hard.** How do you know if the bracelet will fit **around** my wrist?

3. **Try it on**

#### Try this at home

**Family bracelets.** Use beads, pasta, or cut-up straws. Make bracelets the right size for family members, dolls, and stuffed animals.
Have your baby explore the boxes and containers.

See if your hand fits inside the cereal box.

Let’s find a box too small for your hand.

Encourage your baby to crawl through the “tunnel.”

You fit inside!
As you read together, talk about:

Tell me what has happened in the story so far.

If you were in the story, what would you do next?

Let’s turn back to the page before this one.

Let’s see what happens on the last page.
Talk about first, next, last, before, and after as you go about the day.

**TELL ME A STORY**

Tell the story of your day.

**First**, we will go to the grocery store, **next** we will go to the playground.

**After** lunch, we will go to the library.

**First**, we will make a sandwich. **Next**, we will pour a drink. **Last**, we will eat!

**Before** you go to sleep, I will tell you a story.
Trace a triangle in the air!
Math Talk: Bead Bracelet  

Do the activity BEAD BRACELET (HANDOUT 1B).

Fill in your ideas for more math talk for the activity. Use these sentence starters. Check that your ideas are math talk. If they are not, revise them.

How do you know _____________________________________________________?

MAKE SURE IT IS MATH TALK:

Does your question ask the child to explain his or her thinking?

*If not, revise your question so that the answer involves explaining thinking.*

Your bracelet is _____________________________________________________.

MAKE SURE IT IS MATH TALK:

Does your comment use at least two vocabulary words on the activity sheet, like around, large, and small?*

*If not, revise your comment to include math words.*

* You can also use size words like smaller, smallest, larger, largest, long, longer, longest, and short, shorter, shortest.
Brazelete de cuentas

¿Dónde están las matemáticas?

Vocabulario de matemáticas
• Alrededor
• Grande
• Pequeño

Tema de matemáticas
Medir
• Reconocer tamaños como pequeño y grande
• Usar cuerda para medir longitud

Qué se necesita

Para cada niño/a
• 5-7 cuentas largas, macarrones o pasta

Para compartir
• Un ovillo de hilo o de estambre suficiente como para que cada niño/a tenga unos 20-25 cm
• Tijeras (para los adultos)

Qué hacer

① Midamos y cortemos
Cortemos un pedazo de hilo que sea unos centímetros más largo que la muñeca del niño/a.

② Hagamos la brazelete
Atemos la primera cuenta para que no se caiga. Añadamos el resto de las cuentas.

③ Probemos si queda

Para conversar

Fácil. Vamos a ver si queda alrededor de tu muñeca.

Medio. ¿Cómo sabes que el brazalete quedará alrededor de tu muñeca?

Difícil. ¿Cómo sabes si el brazalete quedará en mi muñeca?

Para hacer en la casa

Brazeletes para la familia. Usemos cuentas, pasta o popotes cortados en pedazos. Hagamos pulseras del tamaño correcto para los miembros de la familia, los muñecos y peluches.
¿QUÉ CABE?

Animemos a los bebés a que exploren las cajas y contenedores.

Veamos si tu mano cabe dentro de la caja de cereal.

Busquemos una caja que sea pequeña para tu mano.

Animemos a los bebés a que gateen a través del “túnel”.

¡Cabes dentro!
Lea un libro con una historia familiar, por ejemplo Los tres cerditos o Caperucita roja.

Mientras leemos juntos, hablen sobre:

Dime qué ha pasado en el cuento hasta ahora.

Si estuvieras en el cuento ¿qué harías después?

Regresemos a la página anterior a esta.

Veamos qué sucede en la última página.
Conexiones con los cuentos: Plática matemáticas
Tema de matemáticas: Secuencias
Vocabulario de matemáticas: Después, antes, primero, último, siguiente/enseguida

CUÉNTAME UN CUENTO

Hable sobre lo primero, siguiente, último, antes y después durante el transcurso de su día.

Cuente la historia de su día.

**Primero**, iremos al supermercado, enseguida iremos al patio de juegos.

**Después** del almuerzo, iremos a la biblioteca.

**Primero**, haremos un sandwich. **Después**, serviremos una bebida. ¡Por **último**, comeremos!

**Antes** de irte a dormir, te contaré una historia.
Dibuja un triángulo en el aire.
Plática matemática:
Brazeleta de cuentas

Realiza la actividad de Brazalete de cuentas (FOLLETO 1B).

Para la actividad completa las oraciones inconclusas de Plática matemática con tus ideas. Verifíquelas que sus ideas sean de Plática matemática. Si no lo son, revíselas.

Cómo lo sabes _____________________________________________________?

ASEGÚRESE DE QUE SEA PLÁTICA MATEMÁTICA:
¿Su pregunta pide que su niño/a que explique su pensamiento?

_Si no es así, revise su pregunta para que la respuesta incluya la explicación de su pensamiento._

Tu brazelete es _________________________________________________.

ASEGÚRESE DE QUE SEA PLÁTICA MATEMÁTICA:
¿Su comentario usa vocabulario matemático en la hoja de actividad, como adentro, afuera, grande y pequeño?

_Si no es así, revise su comentario para incluir palabras de matemáticas._

*También usted puede usar términos de medida como más pequeño, el más pequeño, más grande, el más grande, largo, más largo, el más largo y corto, más corto o el más corto.*