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

Before beginning

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

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

A. Welcome and introduction (5 minutes)

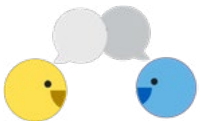
1. Explain session goals

SP

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



SP

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

SP

- Research shows that children do better in all school subjects when they start with strong math skills and positive math attitudes.

SP

- 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

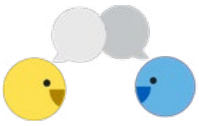
- We are going to watch a video that shows how MAKE CONNECTIONS can help children build math skills and positive attitudes.
- This video shows a mother and child making a necklace to fit a doll. It is based on a MAKE CONNECTIONS activity (ABOUT ME unit, BEAD BRACELET for ages 2 and up.)
- When you watch, think about:

SP

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



SP

How does the mother help the child learn about measuring?

4. Review key points

SP

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.

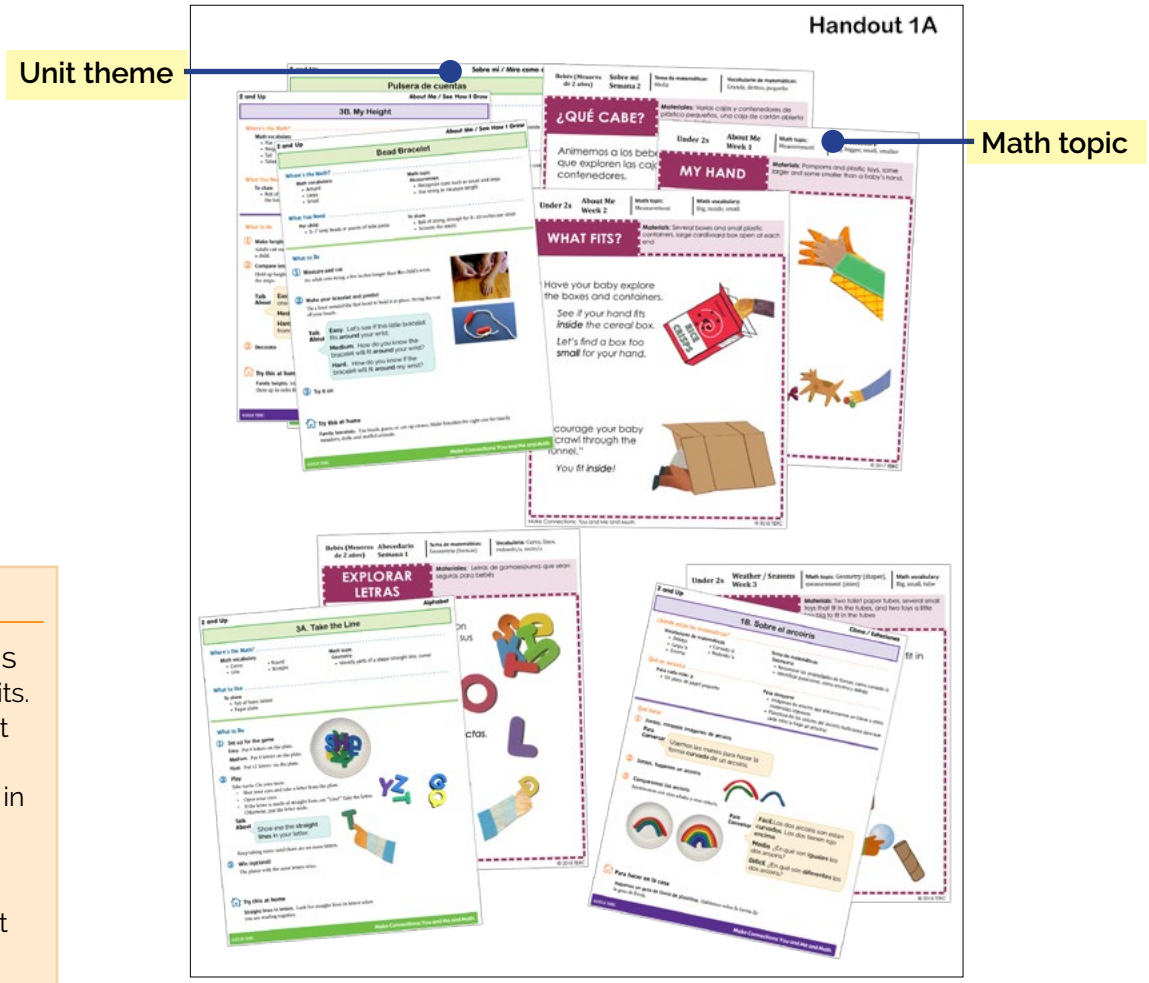
The video shows how children learn math with Make Connections. Children do projects and activities that include math. Adults help them learn by asking open-ended questions like, "How do you know your necklace is too big for the doll?" To answer, children need to explain how they compare sizes. If they 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.



TELL STAFF

Make Connections has 11 curriculum units. Choose the ones that work best for your programs. Use them in any order.

If you use the YMCA ELR model, each unit covers four weeks.

You can use Make Connections in childcare, Pre-K, after-school, and family events.

Download everything at **makeconnections.terc.edu.**

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.

TELL STAFF

Each unit includes eight activities for children 2 and up. Use the activities in order.

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

For ELR, use two activities per week.

Unit theme

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.

2 and Up — **About Me / See How I Grow**

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.

 Make Connections: You and Me and Math

- HANDOUT 1C shows an activity for children under 2, from the ABOUT ME unit.

Read the yellow boxes out loud.

Math topic
Each page addresses an important math topic.

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

Math talk
When you do the activity, use these *italicized* conversation starters to help babies learn math.

Under 2s | **About Me Week 2** | **Math topic:** Measurement | **Math vocabulary:** Big, inside, small

WHAT FITS?

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

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**!*

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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.

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.

- 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.

Storytime Connections
Read Math Together

Math topic: Sequences

Math vocabulary: After, before, first, last, next

TELL ME A STORY

Read a book with a familiar story, such as **The Three Little Pigs** or **Little Red Riding Hood.**

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.

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Storytime Connections
Talk Math Together

Math topic: Sequences

Math vocabulary: After, before, first, last, next

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.

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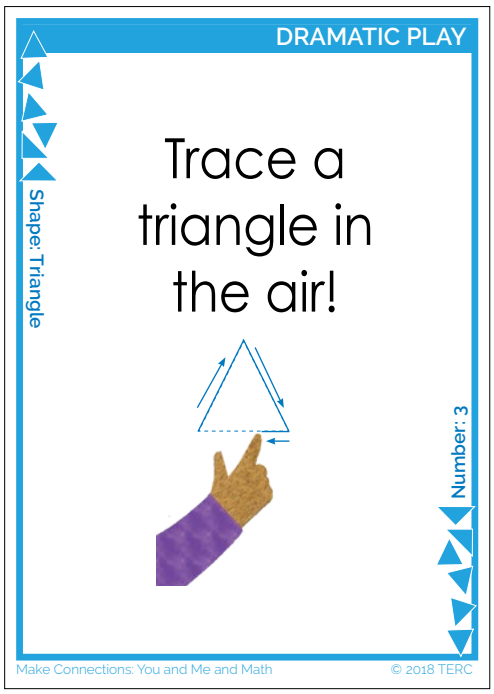
TELL STAFF

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.



DRAMATIC PLAY

Shape: Triangle

Trace a triangle in the air!

Number: 3

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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.

SP

- 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

SP

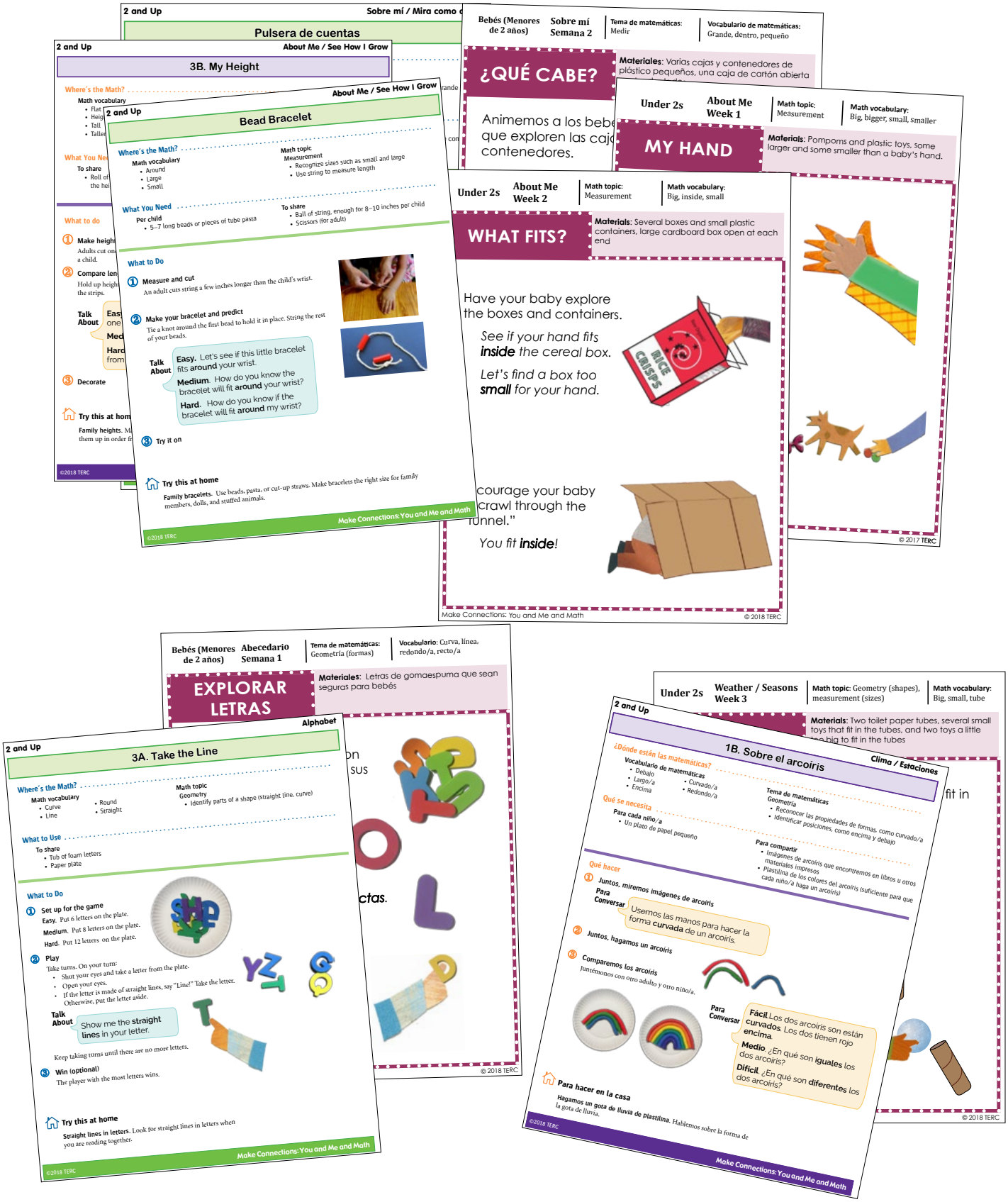
To review, here are the main points of the session:

- 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.

Handout 1A


2 and Up
Sobre mí / Mira como c
Pulsera de cuentas
2 and Up
About Me / See How I Grow
3B. My Height
Where's the Math?
Math vocabulary
What You Ne
To share
What to do
Make heigh
Compare len
Talk About
Decorate
Try this at hom
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About Me / See How I Grow
2 and Up
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
Measure and cut
An adult cuts string a few inches longer than the child's wrist.
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?
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.
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Make Connections: You and Me and Math
Bebés (Menores de 2 años)
Sobre mí Semana 2
Tema de matemáticas: Medir
Vocabulario de matemáticas: Grande, dentro, pequeño
¿QUÉ CABE?
Materiales: Varias cajas y contenedores de plástico pequeños, una caja de cartón abierta
Animemos a los bebé
que exploren las caj
contenedores.
Under 2s
About Me Week 1
Math topic: Measurement
Math vocabulary: Big, bigger, small, smaller
MY HAND
Materials: Pompoms and plastic toys, some larger and some smaller than a baby's hand.
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Under 2s
About Me Week 2
Math topic: Measurement
Math vocabulary: Big, inside, small
WHAT FITS?
Materials: Several boxes and small plastic containers, large cardboard box open at each end
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.
courage your baby crawl through the tunnel."
You fit inside!
Make Connections: You and Me and Math
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Bebés (Menores de 2 años)
Abecedario Semana 1
Tema de matemáticas: Geometría (formas)
Vocabulario: Curva, línea, redondo/a, recto/a
EXPLORAR LETRAS
Materiales: Letras de gomaespuma que sean seguras para bebés
2 and Up
Alphabet
3A. Take the Line
Where's the Math?
Math vocabulary
Curve
Line
Round
Straight
Math topic
Geometry
Identify parts of a shape (straight line, curve)
What to Use
To share
Tub of foam letters
Paper plate
What to Do
Set up for the game
Easy. Put 6 letters on the plate.
Medium. Put 8 letters on the plate.
Hard. Put 12 letters on the plate.
Play
Take turns. On your turn:
Shut your eyes and take a letter from the plate.
Open your eyes.
If the letter is made of straight lines, say "Line!" Take the letter. Otherwise, put the letter aside.
Talk About
Show me the straight lines in your letter.
Keep taking turns until there are no more letters.
Win (optional)
The player with the most letters wins.
Try this at home
Straight lines in letters. Look for straight lines in letters when you are reading together.
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Under 2s
Weather / Seasons Week 3
Math topic: Geometry (shapes), measurement (sizes)
Math vocabulary: Big, small, tube
Materials: Two toilet paper tubes, several small toys that fit in the tubes, and two toys a little too big to fit in the tubes
2 and Up
Clima / Estaciones
1B. Sobre el arcoíris
¿Dónde están las matemáticas?
Vocabulario de matemáticas
Debajo
Largo/a
Encima
Curvado/a
Redondo/a
Tema de matemáticas
Geometría
Reconocer las propiedades de formas, como curvado/a
Identificar posiciones, como encima y debajo
Qué se necesita
Para cada niño/a
Un plato de papel pequeño
Para compartir
Imágenes de arcoíris que encontremos en libros u otros materiales impresos
Plastilina de los colores del arcoíris (suficiente para que cada niño/a haga un arcoíris)
Qué hacer
Juntos, miremos imágenes de arcoíris
Para Conversar
Usemos las manos para hacer la forma curvada de un arcoíris.
Juntos, hagamos un arcoíris
Comparemos los arcoíris
Juntémonos con otro adulto y otro niño/a.
Para Conversar
Fácil. Los dos arcoíris son están curvados. Los dos tienen rojo encima.
Medio. ¿En qué son iguales los dos arcoíris?
Difícil. ¿En qué son diferentes los dos arcoíris?
Para hacer en la casa
Hagamos un gota de lluvia de plastilina. Hablemos sobre la forma de la gota de lluvia.
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Handout 1B

2 and Up **About Me / See How I Grow**

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.

Handout 1C

Under 2s | **About Me Week 2** | **Math topic**: Measurement | **Math vocabulary**: Big, inside, small

WHAT FITS?

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

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****!*

Handout 1D

Storytime Connections
Read Math Together

Math topic:
Sequences

Math vocabulary:
After, before, first, last, next

TELL ME A STORY

Read a book with a familiar story, such as **The Three Little Pigs** or **Little Red Riding Hood.**

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.

Handout 1E

Storytime Connections
Talk Math Together

Math topic:
Sequences

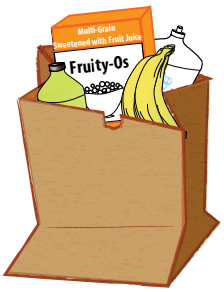
Math vocabulary:
After, before, first, last, next

Talk about first, next, last, before, and after as you go about the day.

TELL ME A STORY

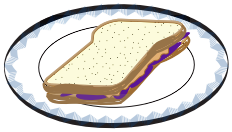
Tell the story of your day.

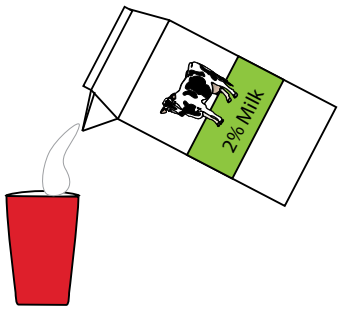
First, we will go to the grocery store, **next** we will go to the playground.



After lunch, we will go to the library.

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





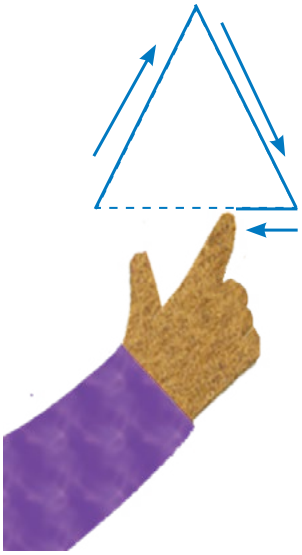
Before you go to sleep, I will tell you a story.

Handout 1F

DRAMATIC PLAY

Shape of the Month: Triangle

Trace a triangle in the air!



Number of the Month: 3

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Math Talk: Bead Bracelet

Handout 1G

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.

Folleto 1B

2 años en adelante **Sobre mí / Mira como crezco**

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.

Folleto 1C

Bebés (Menores de 2 años) **Sobre mí Semana 2**

Tema de matemáticas: Medir

Vocabulario de matemáticas: Grande, dentro, pequeño

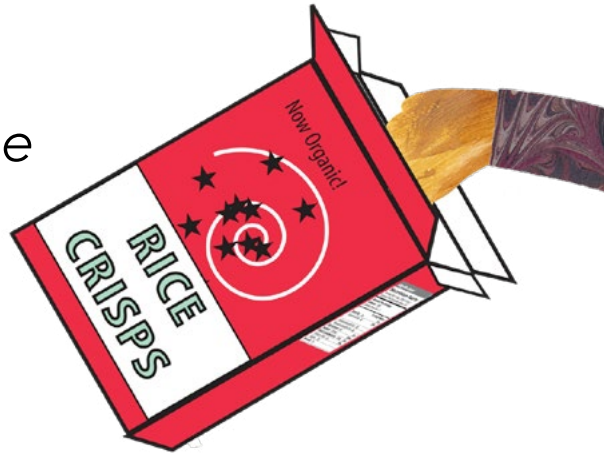
¿QUÉ CABE?

Materiales: Varias cajas y contenedores de plástico pequeños, una caja de cartón abierta por los dos lados

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**!*

Folleto 1D

Conexiones con los cuentos
Matemáticas en los libros

Tema de matemáticas: Secuencias

Vocabulario de matemáticas: Después, antes/anterior, primero, último, siguiente bajo

CUÉNTAME UN CUENTO

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.

Folleto 1E

Conexiones con los cuentos
Plática matemáticas

Tema de matemáticas: Secuencias

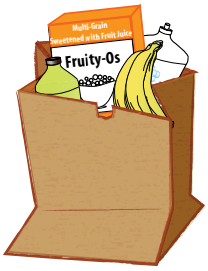
Vocabulario de matemáticas: Después, antes, primero, último, siguiente/enseguida

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

CUÉNTAME UN CUENTO

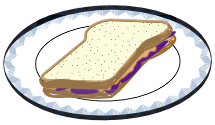
Cuente la historia de su día.

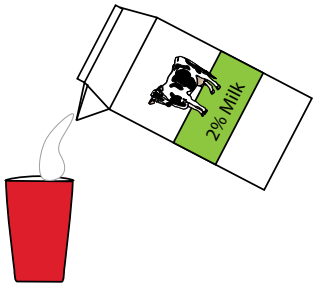
Primero, iremos al supermercado, enseguida iremos al patio de juegos.



Después del almuerzo, iremos a la biblioteca.

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





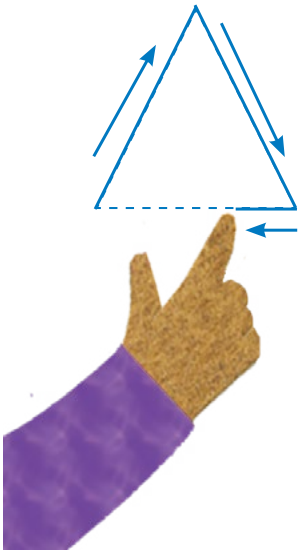
Antes de irte a dormir, te contaré una historia.

Folleto 1F

JUEGO DRAMÁTICO

Figura: triángulo

Dibuja un triángulo en el aire.



Número: tres

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Plática matemática: Brazeleta de cuentas

Folleto 1G

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

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

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.