## Welcome and introduction (2 minutes)

### Explain session goals

Welcome! In this training you will:

- learn how young children explore math by using their creativity,
- learn how children make sense of shapes,
- practice “math talk” to help children build their math skills and confidence.

## Watch and discuss videos (10 minutes)

### Introduce BUILDING SHAPES video

- We are going to watch a video that shows how a caregiver helps her child learn about shapes.
- The child is building with pasta and marshmallows. This is based on a Make Connections activity (Community/Building unit, 3-D House, Ages 2 and Up).
- When you watch, think about:
  
  *How does the mother help the child explore math?*
2. Watch BUILDING SHAPES video

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

   How does the mother help the child explore math?

4. Review key points

   The mother helps the child explore math in several ways:
   - The mother shows enthusiasm.
   - She says she would love to see what the child makes.
   - She lets the child decide what to make. The mother follows the child’s lead.

5. Introduce COMPARING WITHOUT COUNTING video

   - In this video, a mother and child play a game from the WINTER/HOLIDAY unit (ACTIVITY 1A).
     - They are sharing five pieces of uncooked pasta. They take turns taking a piece. The mother ends up with an extra piece.
     - The mother gives the extra piece to the child.
   - When you watch, think about:

     How does the mother encourage the child to compare amounts?
6. Watch **Comparing without Counting** video

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

   How does the mother encourage the child to compare amounts?

8. **Review key points**

   The mother encourages the child to compare amounts in several ways:
   - She lets the child compare amounts in her own way. The child does not yet understand comparing amounts by counting.
   - She follows the child’s lead and asks about the face the child has created.
   - The mother asks, “How do you know?” She does not say if the child is right or wrong. That way, the child learns to figure out the answer herself. Even if children can’t explain their thinking, they will learn that their math ideas matter. This helps them build confidence.

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

   How is the child’s behavior typical of a 3 year old?
10. Review key points

The child behaves like a typical 3 year old:

- She moves around. Children do not need to sit still to do math.
- She is emotional. Emotions can help us learn math and solve problems.
- The child is doing real-life math. She is comparing amounts, keeping track of how many turns each person has, and figuring out who has more.

C. Activity: 3-D HOUSE (10-15 minutes)

1. Distribute and introduce HANDOUT 2

   - You will do the activity, 3-D HOUSE, HANDOUT 2A.
   - The Talk About sections provide math talk to use when the child is doing the activity. In this activity, the Easy and Medium examples are comments. They use math vocabulary to describe what the child is making. The Hard example is an open-ended question that asks the child to explain thinking.
   - As you do the activity, practice saying the Talk Abouts. Then, come up with more math talk for the activity. Fill in the sentence starters on HANDOUT 2B. Make sure your ideas fit the math talk checklist.
   - Avoid questions with a right or wrong answer, like “How many sides does a triangle have?”. Children might answer correctly without really understanding. For instance, they might get the answer right by guessing.
   - Instead, ask open-ended questions, like, “How do you know that is a triangle?” or, “How are these triangles alike?”. To answer, children must explain their ideas. The question helps them learn by noticing and thinking about triangles. You can also explain your own ideas, and they will learn from you.

2. Participants do the activity and fill out HANDOUT 2B

   - Show participants the materials to use. As participants work, circulate to help them see if their ideas fit the math talk checklist. Help them revise if needed.
D. Wrap Up (2-5 minutes)

1. Review key points of the session

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

- Children learn math by exploring, discovering, and using their creativity.
- They need to make sense of math in their own way.
- They learn about shapes by building them and seeing how they fit together.
- Learning math has an emotional component. Follow children’s lead, and let them investigate what interests them.
### 3-D House

#### Where’s the Math?

<table>
<thead>
<tr>
<th>Math vocabulary</th>
<th>Math topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cube</td>
<td>Geometry</td>
</tr>
<tr>
<td>Rectangle</td>
<td>Build and recognize 2-D and 3-D shapes, such as square, triangle, and cube</td>
</tr>
<tr>
<td>Square</td>
<td>Identify positions such as top and bottom</td>
</tr>
<tr>
<td>Triangle</td>
<td>Side</td>
</tr>
<tr>
<td></td>
<td>Top</td>
</tr>
</tbody>
</table>

#### Math vocabulary
- Cube
- Rectangle
- Square
- Triangle
- Bottom
- Side
- Top

#### What You Need

<table>
<thead>
<tr>
<th>Per child</th>
<th>To share</th>
</tr>
</thead>
<tbody>
<tr>
<td>About 50 plastic straws, full and half size, or uncooked spaghetti cut in half and thirds</td>
<td>A few toy people or animals</td>
</tr>
<tr>
<td>About 25 marshmallows</td>
<td></td>
</tr>
<tr>
<td>Two paper plates (for taking home creations)</td>
<td></td>
</tr>
</tbody>
</table>

#### What to Do

**1. Explore and build**

**Talk About**
- **Easy.** I see a **triangle** on the **side** of your house.
- **Medium.** The orange straw is the **bottom** of a **triangle** and the **side** of a **square**.
- **Hard.** How is the **top** of your house different from the **bottom**?

**2. Build a house for your toys**

#### Try this at home

**Build a school.** If you don’t have straws and marshmallows, use toothpicks, pretzel sticks, cut-up dry spaghetti, and grapes or play dough.
Math Talk: 3-D House

Do the activity 3-D HOUSE (HANDOUT 2A).

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

I see ______________________________________________________________________.

MAKE SURE IT IS MATH TALK:

Does your comment use at least two vocabulary words on the activity sheet, like square, triangle, bottom, and top?

If not, revise your comment to include math words.

How ______________________________________________________________________?

(Avoid questions that begin with "How many." Instead, start with "How do you know," or ask about how two things are alike and different.)

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.
Casa de tres dimensiones

¿Dónde están las matemáticas?

<table>
<thead>
<tr>
<th>Vocabulario de matemáticas</th>
<th>Tema de matemáticas</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cubo</td>
<td>Geometría</td>
</tr>
<tr>
<td>Rectángulo</td>
<td>Construir y reconocer formas de dos y tres dimensiones, como cuadrado, triángulo y cubo</td>
</tr>
<tr>
<td>Cuadrado</td>
<td>Identificar las posiciones de objetos como encima y debajo</td>
</tr>
<tr>
<td>Triángulo</td>
<td></td>
</tr>
</tbody>
</table>

Qué se necesita

Para cada niño/a
- Unos 50 popotes plásticos de tamaño completo y mediano, o espaguetis largos sin cocer, cortados a la mitad y en tercios
- Unos 25 bombones de malvavisco

Para compartir
- Dos platos de papel (para llevar a casa las construcciones)
- Algunas personas o animales de juguete

Qué hacer

1. **Exploremos y construyamos**

   **Fácil.** Veo un triángulo al lado de tu casa.
   
   **Medio.** Este popote anaranjado es la parte de abajo de un triángulo y el lado de un cuadrado.
   
   **Difícil.** ¿Dónde podrías poner otro triángulo en tu casa?

2. **Construyamos una casa para los juguetes**

Para hacer en la casa

**Construyamos una escuela.** Si no tenemos popotes y malvaviscos, podemos usar palillos: palitos de pretzel o espaguetis secos partido y uvas o plastilina.
Plática matemática:
Casa de tres dimensiones

Haz la actividad CASA DE TRES DIMENSIONES (FOLLETO 2A).
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.

Yo veo ____________________________________________.

ASEGÚRESE DE QUE SEA PLÁTICA MATEMÁTICA:

¿Su comentario usa al menos dos palabras del vocabulario en la hoja de actividad, como cuadrado, triángulo, abajo y arriba?

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

Cómo ____________________________________________?
(Evite preguntas que comiencen con "¿Cuántos...?”. En su lugar, comience con “¿Cómo sabes...?” O pregunte cómo dos objetos son similares o diferentes.)

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.