

## ***The Math in Music & Movement*** – Booth Church, Ellen

**How can you connect music and movement to math? By incorporating musical activities throughout your day, you can provide children with opportunities to strengthen basic math skills.**

Think about the skills involved in singing a song such as “This Old Man”. This simple song incorporates many basic math skills, including matching and comparing (through changes in pitch, volume, and rhythm); patterning and sequencing (through repetitions of melodies, rhythms, and lyrics); and counting and addition (identifying cardinal numbers and adding one more with each verse). When you add moving to the beat, you have created an entire mind/body package of learning rolled into one song!

**A Step – by – Step Approach:** The acquisition of math skills follows a developmental sequence. Children learn the structure of math before they can use and understand its vocabulary and symbols. Numbers are symbols that represent “how many” of something. Recognizing the symbols does not equal

understanding the concepts they represent. Too often we begin working with children on numerals before teaching them what the number symbols mean. It’s important to remember that counting is more than memorizing a sequence of words. Children learn about the basic structure of math by seeing the relationship between things. For example, matching things that are the same or equal is a basic math concept. In music, children use language, perceptual and auditory skills to match sounds, beats, pitches and speed or tempo. In fact, children do this (without even knowing it) every time they sing a song.

**Musical Matching:** You can focus on the skill of matching with simple “Call and Response” musical games. Sing a tone or make a sound and ask children to repeat it. Just one note, you can do it! Try making “sounds that cannot be spelled”, such as mechanical sounds, made-up sounds, funny sounds, even operatic sounds! When children match your sounds, they are using one-to-one correspondence skills. As in any good math or science activity, if you “change the variable” you change and expand the experience as well as the understanding. Experiment with having children match sounds, beats, words, pitches, and speed or tempo. Try it with the

voice and the body, with objects and instruments. Each time you invite children to apply these skills in a different way, you reinforce not only their understanding of the math concepts but their ability to apply and use their skills. Use the rhythm of children's names for a musical matching activity. Say a child's name and invite children to match a clapping beat to it. My name "Ellen," has two claps, but "Cassandra" has three. Ask children: Who has a name with a beat that matches yours? Can you tap the beat of the names with your feet? Can you snap it? Now here is a challenge: Can you tap the beat of your name while others are tapping theirs? Children can not only clap out the beat of their names, but move to them too! Invite children to invent a one-, two-, three- (or more) part movement to represent the syllables in their names. For example, Jessica might move to her name with a three-part arm movement: "1 – arms out, 2 – arms up, 3 – arms down." Each time children match something, they are fully experiencing the mathematics concept of *equal* or *same as*. You can also practice the concepts of *more than* and *less than* with name clapping. What names have more claps? Which have less?

**Making Comparisons:** Comparing is an important mathematical skill. What kinds of

comparisons are involved in music? There are loud and soft sounds, fast and slow beats, high and low pitches, and long and short notes. You can introduce comparison games by inviting children to listen and create the opposite sound or beat of what you are making. For example: Hold a long, high sound and invite children to echo it. Then ask them to make the opposite sound. Create a slow beat on a drum or clap it. Invite children to walk to the beat, matching their steps to the steady sound. Then do the opposite, a fast beat. How will they move to this beat? Pass out rhythm instruments and encourage children to explore the variety of sounds they can make. You might ask, "Can you make a soft sound? A loud sound? A fast beat? A slow beat? Then enjoy a comparison song with children, such as the following: "Make Music Softly" (to the tune of "Where is Thumbkin?")

*Make music softly,  
Make music softly,  
1-2-3,  
1-2-3,  
Play it very loudly,  
Play it very loudly,  
Just like me,  
Just like me.*

Change the verses to create new comparisons. Try clapping slowly, then fast, or sing low then high.

**Moving in Opposite Ways:** Add movements to your comparisons activity by playing an “opposites” game that invites children to physically explore the mathematical comparisons of high and low, fast and slow, up and down, and big and little. Play a recording of lively music and ask children to move freely to the music. Encourage them to make high movements and then have them do the opposite.

**Sort It Out:** Sorting and categorizing are important early-math skills. Children can sort sounds by timbre. Plastic, wood, and metal sounds all have a different quality or timbre of sound. Invite children to sort the classroom rhythm instruments by timbre. Then use them to accompany a favorite song. Use an old favorite song such as “The Wheels on the Bus” – children can use the different parts of the bus (wheels, windshield wipers, horns, and so on). Change the words of “Old MacDonald Built a House” and ask children to sort and match each of the different types of sounds for each verse. What instruments could make the sound of a hammer, a paintbrush, a saw?

**Keep With the Beat!:** Patterning is another important component of math –

and music consists of patterns. The beat is the compelling part of music for children. Put on something with a strong baseline beat and you will have children rocking and rolling right away. The beginning stage of patterning is echoing. Much like in the earlier stage of matching, children repeat a rhythm or a melody by clapping or singing. The difference is that there is a longer sequence for children to hear, learn, remember, and repeat.

**Clap ‘n’ Move:** Can you do two things at once? How about walk and keep rhythm pattern going? This is a great “next step” for children to take as they explore the pattern of a rhythmic phrase with their bodies. Create a clapping beat with children, something simple such as 1 + 2 + 3 + 4, 1 + 2 + 3 + 4. Then invite them to stand up and walk and clap only on the “off beat” of the “+” in the phrase.

**Count On It!:** You’ll all know many wonderful counting songs. Why do they work so well? Because instead of having children count by memorization and rote, the songs encourage children to count to a beat, a tune, a motion, or all of the above. Rhythm is the ultimate and most compelling counting object! Songs such as

“Caught a Fish Alive” not only count up to 10 but follow tones up a scale, thus reinforcing the counting (and adding one) experience. Many jump rope and ball-bouncing chants involve counting up the number line as well (“One Potato, Two Potato” or “Cinderella Dressed in Red”). These rhymes and songs help connect the beat with an action and the numerals.

**“Cinderella Dressed in Red”** (A ball-bouncing rhyme in which a child bounces a ball or hops on one foot as long as he can!)

*Cinderella dressed in red.*

*What time did you go to bed?*

*1,2,3,4,5,6,7,8,9,10,11,12.*

*Prince Charming dressed in red.*

*What time did YOU go to bed?*

*1,2,3,4,5,6,7,8,9,10,11,12.*

Some songs invite children to count backward (subtract) instead of forward (add) – seemingly a difficult thing to do at such a young age, but in the context of a song, children are able to “take away one” quite easily. “Ten in a Bed” is one of the best songs for backward counting: **“Ten in a Bed”** *There were ten in a bed and the little one said, “Roll over, Roll over!” So they all rolled over and one fell out ... There were nine in the bed ... And so on, until there is ONE in the bed and the little one said, GOOD NIGHT!*

**Moving Dramatically:** Want children to get a deeper understanding of number values? Make it experiential! Invite children to dramatize the song “Ten in a Bed” and watch as they enjoy the physical experience of “subtracting” as they roll over and “fall out of bed.” When should you be making the connection between music and math with children? If you are comfortable with singing and moving, the answer is ... all day long! Make the music – math connection during transition times, outdoors on the playground, while cooking or eating snack, and in your learning centers. All the while you’ll be laying the foundation for the development of math skills – with a little rhythm.