



ANGELA RUSS –AYON **MATH, MOTION, AND** **CONNECTING THE THOUGHTS**

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EARLY MATH DEVELOPMENT INCLUDES LEARNING THAT NUMBERS...

- 1) ...have a corresponding WORD
- 2) ...refer to a particular QUANTITY
- 3) ...can be represented in DIFFERENT WAYS
- 4) ...are used to COUNT
- 5) ...help us COMPARE and ORDER QUANTITIES.
- 6) ...are a MEANS for SOLVING PROBLEMS

BEYOND THE STANDARDS, WE WANT CHILDREN TO...

- Be curious
- Keep working and persevere
- Reason abstractly and quantitatively
- Practice and build upon their skills
- Use appropriate tools strategically
- Share their findings
- Discuss & defend their results
- Feel comfortable and confident in their abilities

Young children are naturally curious, observant, and develop their own understanding of math over time - based on their life experiences. They build upon concepts they already know and have been exposed to, practicing early math skills every single day without having learned math symbols and equations. For instance, they know the Band-Aids are stored by size and applied based on the size of their "boo boo." They know their daddy is bigger than they are. They know to put away their shoes in pairs.

Early math/STEM includes concepts other than numbers, counting and shapes: fast/slow, empty/full, heavy/light, heavy/light, whole/pieces/parts, near/far, pathways, directionality, measurement, passage of time/routines, patterns, positions in space, and so much more. It's up to us to help make learning concepts fun!

ENCOURAGE CHILDREN TO BUILD A COLLECTION...

They use their observation skills to compare and contrast colors, shapes, sizes, age, condition, and other relevant characteristics.

Music prompts greater connectivity between the brain's left and right hemisphere and between the areas responsible for emotion and memory, than does almost any other stimulus.

- Dartmouth, Petr Janata, *Science* 2002

WHEN CHILDREN SING NURSERY RHYMES...

They learn the math skill of natural comparisons. Select one and emphasize the differences when singing traditional nursery rhymes:

- Distinguish between a variety of instrumentation
- Long & short notes (stretch wide, hug tight)
- Fast & slow beats (run, walks slowly)
- High & low pitches (up, down)
- Loud & soft sounds (wake up, sleep)

MUSIC IS A GREAT TEACHING TOOL FOR:

- Measurement: holding a note, length of time / no. of beats
- Extending patterns and sequences using clapping or the body in motion
- Physically experiencing positions and directionality
- Developing number sense and practicing counting
- Learning to work together within a musical/rhythmical framework, like a band

MATHEMATIZE EACH DAY!

Math should be as common in informal settings as it is in any formal math activity. Help children discover math...

- **in the block corner** "What would happen if you took this block out and put this block in?"
- **during felt stories** "What if no baby ducks came back to mama?"
- **at circle time** "How can we all sit so we don't trip our friends?"
- **during story time** "What if there were 100 Very Hungry Caterpillars?"
- **in transition** "How can you move to take *exactly* 10 steps to the door?"
- **in pretend play** "How did you know which sweater would fit your doll?"
- **during snack time** "How can we tell which fruit is liked the most?"

BEYOND ROTE COUNTING Here are some creative ways to move with math! Select those that pertain to the age group you are working with.

- Count together while marching, stepping, jumping, etc.
- Step or jump onto numbers while counting
- Count while playing clapping games
- Dance freeze ("1, 2, 3, freeze! 4, 5, 6 freeze!")
- Follow the Leader (doing activities a number of times)
- Count down from a squat or sitting "Blast-off!"
- Draw a number & move that many times
- Make a number with lace/rope/chalk and motor around it
- Each grab a number and line up in order
- Beat the countdown clock at clean-up time
- Count steps to a destination, or up and down the stairs
- Toss a beach ball or cube and count the catches/throws
- Move and count how far or how long
- Mimic animal moves while counting:
flap, stomp, bear walk, step sideways (crab), etc.
- Count by feeling "what's in the bag," instead of seeing
- Take children outside and count items from nature

MOTOR SKILLS: Direct children to move, count, and change direction - to speed up and slow down to the beat of a drum - or interpret the feeling or tempo of a song. Interject positional and descriptive math language when prompting to complete motor skills.

• **NON - LOCOMOTOR SKILLS**

| | | | | | | |
|------|-------|-------|---------|-------|---------|------|
| Curl | Stand | Rise | Swing | Twist | Lift | Clap |
| Bend | Sit | Fall | Turn | Squat | Pull | |
| Hold | Push | Reach | Balance | Wave | Stretch | |

• **LOCOMOTOR SKILLS**

| | | | | | |
|---------|-------|-------|-------|------------|--------|
| Crawl | Stomp | Lunge | Leap | Climb | Gallop |
| Walk | Run | Trot | March | Crisscross | Jump |
| Tip-Toe | Skate | Slide | Skip | Side-step | Hop |

PROVIDING INSTRUCTIONAL SUPPORT

Before they walk and talk, children interact with caregivers. Strengthening positive relationships is absolutely critical for improving child outcomes in the following areas:

- Self-confidence
- Motivation to learn
- Mental health
- Achievement in school
- Conflict resolution

Ask questions that present an alternative to the actions children take to help them articulate their decision-making process.

- Praise attempts.
- Use open-ended questions - Questions that cannot be answered with one word, such as yes, no, 5, or yellow.
- Don't expect to know the answers you will receive.
- Discover how children arrive at their conclusions by asking for explanations.
- Make real-life connections.
- Use whole sentences - not fragments.
- Use a variety of words in simple phrasing.
- Phrase and re-phrase questions until children understand what you are asking.
- Build on what children say by affirming, encouraging, and then serving, and returning open-ended questions.

- "How did you decide to...?" "Why did you...?"
"What if you...?" "Tell me about...?"
"How else could you...?" "Why do you think...?"
"How are they alike/different?" "How can you tell...?"
"What might happen if...?" "How do you/did you...?"

Create serve and return experiences. Ask questions and WAIT for children to process the information and formulate a response. You want to keep the ball in their court for as long as possible. You might be tempted to chime in and start teaching, but don't. Slow down your day, and give children time to teach you!

Examples of open-ended questions and number sense:

Count objects outside

- You broke the stick. What do you notice about it now?

Count jumps, steps, leaps

- What if you took big, wide steps instead?

Count snacks

- How can we make sure everyone gets a spoon?
- What shapes can your napkin make?

Count objects cut and glued / colored

- What can you do to get all of the hippos in the pen?

Count during play

- How can you make the train long enough to reach the wall?
- How can you make the train short enough to fit in station?
- How do you know how much sand to put in the bucket?

Count objects in a book

- How does the green fish compare to the red fish?

Count at bath time

- What would happen if 2 ducks sank to the bottom?

EMBED MATHEMATICAL CONCEPTS throughout each day using terms and expressions that give children more exposure to math language: Altogether, put together, in all, equal parts, share

equally, split it up, take away, the difference between, and "How many are left?" Then follow up with an open-ended question.

Positional and Descriptive words help children learn the language of MATH

Positional Words:

Front/back/behind
Top/bottom
Center
Next to/Beside
Between/Through
Before/After
Over/Under
On/Off
Above/Below
Inside/Outside
Left/Right
Up/Down



Measurement Words:

Taller/Shorter
Smaller/Bigger
Thinner/Narrower/Wider

Distance Words:

Close to/Far from
Near/Far
Shortest/Longest

Math Terms:

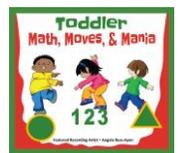
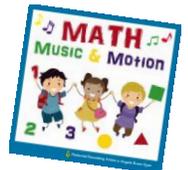
First/Second/Third..
Next/Then/Last
Different
Same/Alike/Similar
Zero/None/Nothing
Every/All
Few/Some
More/Less
Add/Subtract
More than/Less than
How many
Together/Pair
Full/Empty/None
Half/Medium
Single/Piece
Even/Odd
Horizontal/Vertical
Parallel

Moving to commands using math language helps children understand spatial concepts and relationships. Directing children on where and how to move also expands their vocabulary and helps them communicate more effectively.

PATTERNING & SEQUENCING Skip counting, addition, and times tables all require an understanding of and proficiency in patterning. Developmental stages: recognize, describe, copy, extend, and create. Assign objects/shapes/colors to real-life experiences and set the items in repeating patterns, repeating the sequence of the experience. Sequence an action using a series of moves, claps or beats. Patterns and sequences that are put to melody are easier to remember and extend.

MUSIC REFERENCE LIST:

- ♪ "Count from 1-100" CD: "Math Music & Motion" (Count from 1 – 100 using 5 cultural dances)
- ♪ "Two Clapping Hands" CD: "Math Music & Motion" (Bilateral symmetry, classify body parts in pairs)
- ♪ "Shake Your Boom Boom" CD: "Smart Moves 3" (Spatial sense, opposites, conceptualization)
- ♪ "When I See Shapes" CD: "Math Music & Motion" (Identify shapes and assign each a physical activity)
- ♪ "Shake, Mix, Pound, Roll" CD: "Smart and Tasty 1" (Patterns and sequencing of events)
- ♪ "Number Chant 1-10" CD: "Smart Songs 1" (Chant instructions on how to write numbers 1 to 10)

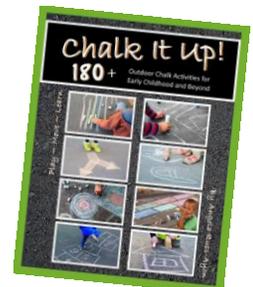


BOOKS:

- "When You Find Colors and Shapes"
ISBN: 978-0-9799612-6-7 Paperback / 32-pages
"Cuando Encuentras los Colores y las Formas"
ISBN: 978-0-9799612-8-1 Paperback / 32-pages

"Chalk It Up!"

- Resource guide for outdoor chalk activities.
ISBN 13: 978-0-9799612-9-8
ENGLISH / Black & White interior
102-Pages and 33 journal pages



**Thank you for listening,
and welcome to the CLUB!**