



a neurocognitive motor
math program
designed to teach
children ages 6-12
math facts and factors



Dear Parents, Teachers and Colleagues,

Have you ever wondered why some children seem to master their math facts so easily and yet others, perhaps your child, has difficulty remembering the answer to 6×9 ?

They're just math facts, they should be so simple. Yet 3rd-5th grade math causes much anxiety for millions of children and their parents. How can we help? With **PLAY MATH** ~ A neurocognitive approach that engages the cortex while moving around the defensive brain reducing anxiety and increasing confidence.

Play Math integrates the newest neuroscience research with occupational therapy, psychology and physical education. Rarely does a program integrate aspects from such a variety of professions and research.

What follows is a description of the simple methodology for you to explore and make your own. Play Math is not a direct instruction method, it's a method founded in the work of Luria, Das, Carpenter, Vygotsky, Fletcher and more, allowing for freedom and creative play. Alternating fine and gross motor movement, play math enhances conceptual math understanding while teaching number composition through play.

A central feature of Play Math is the confidence-building process of sharing one's knowledge with family members and other children. As the older children learn their math facts, they can become **Math Mentors** for younger children. They can do simple things like make videos or hold Math Nights teaching family members and friends their new-found knowledge. The resulting improvement in self-esteem is part of the joy of **Play Math**.

Our goal is simple ~ to change the trajectory of children's conceptual understanding of fact families (multiplication and division).

You're now a **Play Math Ambassador**, please spread the word that "**Motor movement enhances learning.**" Email me thefamilycoach@gmail.com with any insights or ideas you have to improve the program. I am listening.

peace and joy.

dr. lynne



The History of **PLAY MATH!**

Play Math is the motor math program I recently developed when my fifth grader was having difficulty remembering her math facts. As a parent, my heart-strings were pulled as I watched my bright daughter learn her math facts and forget them the next day. I wondered why? I phoned Dr. Martin Fletcher, Clinical Director at Eisenhower Center, a state-of-the-art traumatic brain injury clinic for answers. He is a cognitive scientist who has taught math to children for years.

Over the course of eight months we studied research regarding cognitive science, brain development, learning, psychology, motivation, play, mentoring and physical education. Then we developed a motor math program that combines research from multiple disciplines to help children ages 6-12 learn their math facts, factors and conceptual math.

The most exciting aspect of this program is that children helped develop it. We piloted the program in a local school, with children who had difficulty remembering their math facts. I learned more from the children than they learned from me. Their creativity was stunning.

In ten 45 minute sessions, the children went from being students to mentors, teaching other children their math facts. 90% of the children who “played math” doubled their multiplication math scores in six to twelve weeks. I can imagine what you are thinking, I was shocked as well.

What worked? The neurocognitive components of Play Math. When we alternated gross motor movement (tossing, throwing, passing, bouncing balls) with fine motor movement (touching, counting, sliding, building base ten blocks) the children’s brains took in the knowledge in a multi-sensory manner.

My gratitude to Dr. Martin Fletcher, who introduced me to the foundational work of Dienes, Vygotsky, Das and Cuisenaire.



How Does **PLAY MATH** Work?

When we **engage the cerebellum and the frontal lobes** of the brain, through motor movement + cognition, we introduce the children to whole brain math. No longer are we relying only on visual and auditory input, we are utilizing the cortico-cerebellar connection to learn math skills (Ito, 2011; Koziol & Budding, 2008).

How Do We **PLAY MATH**?

We teach number relationships with fine and gross motor movement leading to a conceptual understanding of fact families and factors. This generates a natural scaffolding of math skills far beyond symbol relations and memorization, It leads to meaningful math.

Did you know up to 50% of 7th graders do not have a good understanding of their math facts? Why is that? Working with children grades K-5, I observed that many children are taught math symbolically. They are taught counting and then go straight to number lines and then equations $3 + 3 = 6$; $9 \times 2 = 18$. This manner of teaching is primarily auditory and visual. What the children are missing is a conceptual understanding of the relationships between the numbers.

In our simple motor math program, **Play Math**, we teach meaningful math using kick balls, along with polyspots, marker boards, markers, and Unifix blocks to play math motorically. We see math, say math, play math, write math and build math so that the children begin to develop the ability to **THINK mathematically**.

Here today, we will teach you the simplest motor movements and math composition strategies. From here, you and your children can make up games, use other sports equipment, draw, play and create. The sky is the limit.



Foundational Concepts

1. **WE SEE** ~ We see the number relationships with base ten blocks and marker boards. We begin with pre-symbolic math looking at and talking about the numbers represented by base ten blocks. Many children experience “AH-HA” when they can see what $9 + 4$ actually looks like.
2. **WE SAY** ~ Math is a language based activity. We say what we see, we ask questions and we communicate about math as we play.
3. **WE PLAY** ~ We introduce the math concepts, we wonder aloud and allow the child to see, say, play and build math. It is important that we do not instruct. Children get enough instruction in school. We want to play and have fun with math concepts.
4. **WE TOUCH** ~ We encourage the children to touch the base ten blocks. They count the ones, move the rods and talk about the numbers they are building.
5. **WE MOVE** ~ Each activity has a motor component, some use fine motor manipulation and others use gross motor movement. This way we engage the whole brain not just the visual and auditory brain systems.
6. **WE CROSS** ~ We incorporate large motor movement using rhythm. We begin with simple ball bouncing to establish rhythm. Then you can move to passing balls across the body, to the side and overhead. Crossing the midline integrates brain hemispheres and enables the brain to organize itself.
7. **WE BUILD** ~ As the children begin to build numbers with the base ten blocks, we start to teach them that multiplication is fast counting. We teach them the “over” and “up” numbers to introduce multiplication and factors.
8. **WE WRITE** ~ As we progress we start to write number equations, fact families and factors.



If you have a child who is learning math or struggling with math, adding visual motor and play components to their math development is a fun and effective way to teach math facts.

Once the children understand their math facts, they are able to answer equations, manipulate math concepts in their heads and move on to factors, fractions and algebra. Best of all, they can become Math Mentors and teach other children.

Simple Foundational **PLAY MATH** Concepts.

1. We always begin with **rhythmic mirror counting** with large bouncing balls (playground or beach balls). I know it sounds so simple but bouncing a ball while counting is magic.
2. Once we have mirror counted a number, we move to **skip counting**. Skip counting is addition and multiplication. Imagine learning multiplication prior to third grade, the kids adore it!
3. When we “**get stuck**” on a number we sit down with the base ten blocks and “play math.”
4. When we have “seen” “touched” and done “**slide and glide**” with the blocks, we then get up and bounce, pass or throw the gross motor balls again.
5. Once we understand skip counting, we can subtract, add, multiply and divide. (Wait til you see!)
6. We learn the “**over and the up**” number to teach multiplication.
THEN
7. We fit numbers into other numbers learning multiplication and factors.

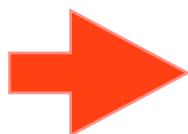
The children are delighted to learn that, as they build math with base ten blocks, they are learning multiplication and math factors.



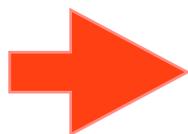
For many children, playing math 15-30 minutes at a time, for 10 - 20 sessions is enough for the children to begin to think mathematically. As they begin to succeed their confidence grows and their imaginations and thinking skills blossom.

Parent Tip

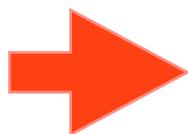
Remember we are not teaching, we are playing.



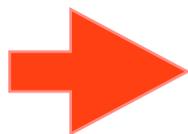
Bounce the large ball back and forth between you and your child or you and the student. You can do this one on one or in small groups of children. Rhythmically mirror count with new learners and alternate the counting via skip counting with older learners.



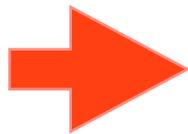
When the child gets stuck and can go no higher we say “Let’s play math.” **Sit down with the base ten blocks, ask the child to create rods that correspond to the number they were skip counting and let the child “count them out.”** On the marker board, slide the rods from left to right as you count together. This is the “slide and glide” procedure.



When the child sees how the numbers add together to “make” bigger numbers, get up again and bounce, throw or pass the ball to mirror or skip count.



We show the children that multiplication is simply fast counting as they touch the over and up numbers on the rectangles or squares that make complete factor arrays.



We enhance the play aspects of learning with marker boards, polypots, tennis balls and more. The children’s imaginations and creativity make this great fun.

Ready, set go!

Alright, so what we're going to do here is go through the steps from mirror counting to the over and the up using **10's as the example**.

When you use your imagination you can see that the same wording will fit for 5's, 2's, 3's, 4's etc. Be yourself and be encouraging.

“Let's build 2's.”

“Let's build 3's.”

The key is to explore, play, compose the numbers, see what numbers fit into other numbers, discuss the numbers, move, play and play more.

Play Math is super simple, bounce the ball, build the numbers with blocks and look for what numbers make up other numbers.

rhythmic movement





rhythmic movement

Rhythm

R

say it

Let's begin bouncing the ball.
We'll stand a few feet apart.
I'll bounce the ball to you and
you bounce the ball back to
me.

Prompts:
Nice bouncing.
Can you hear the rhythm?
1-2; 1-2

We are bouncing in a steady
beat.
You're great at this.
Good work.
We're getting ready to add
numbers.

Rhythm

R

play it

Bounce the ball between you
and the child creating a nice
V between you with the ball.
Establishing rhythm helps the
brain develop order.

Show the child that if you hold
the ball with two hands, one
on other side of the ball and
push it into the center of the V
you have more control.

Smile, make this playful and
fun, we want the child to
enjoy the movement.

Rhythmic movement is the very beginning of play math. Some children who have difficulty with aspects of learning need help coordinating their large motor movements with solid timing. When the children learn to rhythmically bounce the ball, they begin to experience mastery and confidence. The rhythm assists in their motor planning, coordination and focus.

mirror counting





mirror counting

Mirror Counting

10

say it

Let's add some numbers. When I push the ball I'll say a number. When you push it back, you repeat the number I said.

This time, I say 10, you say ten. Ready, 10 (10) 20 (20) 30 (30) 40 (40) 50 (50) 60 (60) 70 (70) 80 (80) 90 (90) 100 (100). Great job! Pretty soon you'll be teaching me!

Prompts:
Great counting.
Let's keep the rhythm.
This is easy.

Mirror Counting

10

play it

Bounce the ball between you and the child creating a nice V between you with the ball. As you bounce the ball say 10, then 20, then 30 and so on to 100.

There may be moments when you lose the ball, it rolls away, have fun when you chase after it. This is to be fun.

Next, you'll skip count tens and then it's time to open the blocks.

Mirror counting 10's is rather easy for most children. This step is to help the child master the process of adding language to the movement. The foundational numbers 10's and 5's improve confidence so children can succeed with 6's, 7's, 8's and 9's. These are the numbers that cause many children difficulty.

skip counting





skip counting

Skip Counting

10

say it

We did that so well, shall we try to alternate the numbers? I say 10, you say 20 and so on? I think we can do it.

Here, you have the ball and start, you can be the teacher. You say 10 and I'll say 20. You say 30 and I'll say 40. Let's give it a try.

Prompts:
You are a great teacher.
I think we're getting the hang of it.
Now we're ready to SEE what 10's LOOK LIKE.

Skip Counting

10

play it

Bounce the ball between you and the child with a nice constance rhythm. As you bounce the ball say 10, then 20, then 30 and so on to 100. The child can also begin.

If the child is having fun and wants to go beyond 100, take the child's lead, empower the child to be the leader.

Next, it's time to open the blocks, so go for it, get down on the floor or sit at a table and open the blocks.

In America we count using a decimal system. We count in 10's. That is why we begin with 10's even with 5th graders. Later, this allows us to talk about place value, larger numbers and how fast the children can problem solve when they understand the decimal system.

building #'s





building 10's

Building

10

say it

We did a great job bouncing 10's now let's see what they look like when we build them. Open the box let's see what is inside.

We can take these ones and make them tens. Let's build some ten rods.

Prompts:

What do you notice about these tens?

If we put two tens together how many do we have?

What if we have three tens?

How many tens will we need to make 100?

Building

10

play it

Now it's time to explore what numbers LOOK LIKE. Many children are used to thinking of 20 as a symbol. But with Play Math we like to see the numbers in rods.

Let the child pick a color and make several ten bars with one color. Explore what the tens are made up of. One ten could be nine ones and one one. A ten could also be two ones and one eight and so on. Allow the child to explore with tens, talk about what numbers make up larger units of 10.

One reason Asian children excel at math is because from the beginning of their math experience, the teachers encourage the children to “compose numbers.” The children look at what numbers make up other numbers. This leads to a deeper conceptual understanding of math. For more read, Liping Ma (2010) Knowing and Teaching Elementary Mathematics: Teachers' Understanding of Fundamental Mathematics in China and the United States.

slide and
glide





slide and glide

Slide n Glide

10

say it

What do we see if we put the rods on the left side of the marker board and slide them to the other side?

Can we count them as we move them?

Prompts:
That's 10, that's 20.
When we get stuck we can use our pointer fingers to count. Multiplication is just fast counting.

Slide n Glide

10

play it

Let the child experience sliding the rods from the left to the right hand side of the board. Help them skip count as they move.

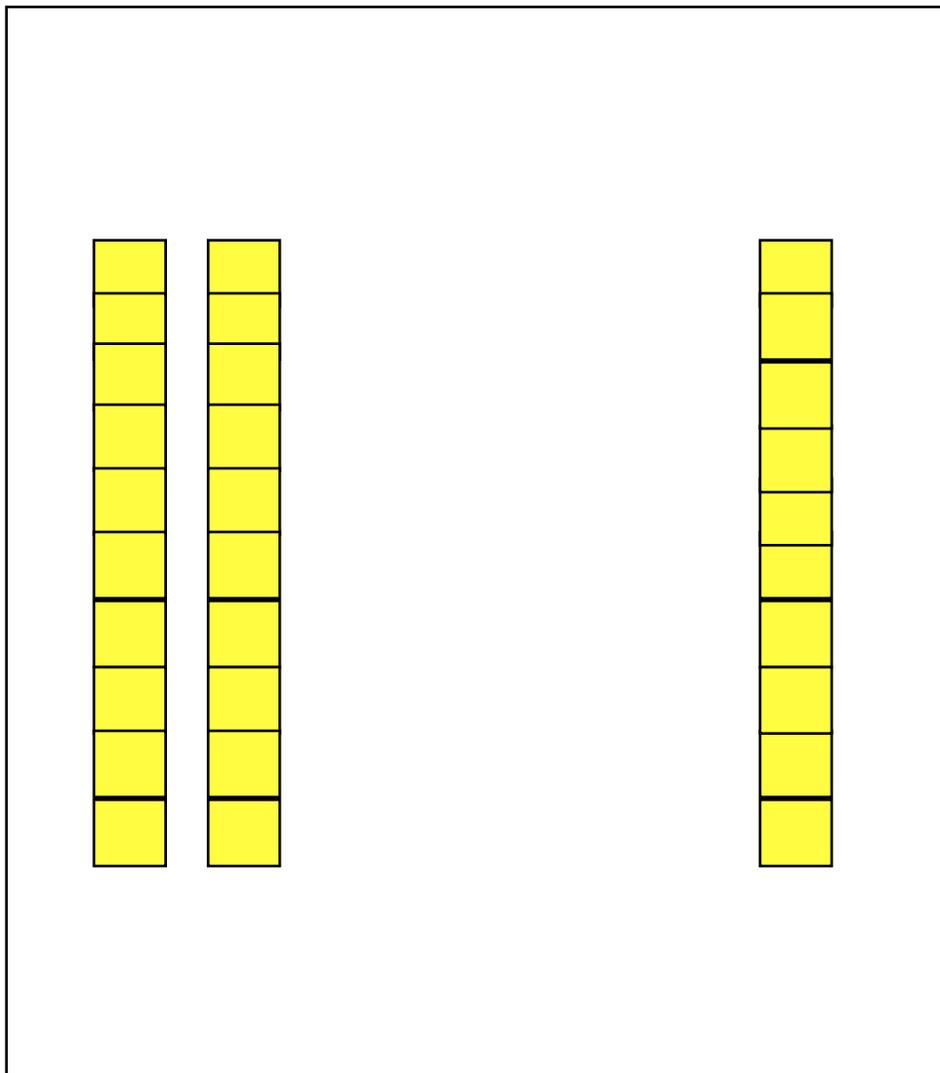
You will meet many children who count on their fingers. Research shows that storing math facts (multiplication and division) in long-term memory facilitates algebra. So we wish for them to get used to counting rods not fingers.

Research shows that when we touch blocks to move numbers the information enters our brain along novel neuronal pathways. This leads to better kinesthetic memory of the numbers we are building. The Slide and Glide technique shows children how to build, decompose and count numbers.



What Does The Slide and Glide "Look Like?"

Here is your marker board, on the left you place your rods and you move them with two fingers to the right while skip counting. If you forget or need help just use your pointer finger to count individual blocks.





Throughout the play math process you are alternating gross motor movement with fine motor movement. Later, when you're feeling creative you can move on to polyspots, cones, jump ropes and more.

As your child develops confidence you can show how the blocks would be divided as well. This may evolve naturally as the children play and explore.

a few
more cool
concepts



Thinking It Out



So far we have spoken of four steps in Play Math. First we establish rhythmic large motor movement to engage the cerebellum and the cortex at the same time as we begin to open up neuronal pathways for math learning.

We have explored:

Step 1: Establish rhythmic bouncing

Step 2: Mirror Count

Step 3: Skip Count

Step 4: Build the numbers with Unifix Blocks, slide and glide on the marker board.

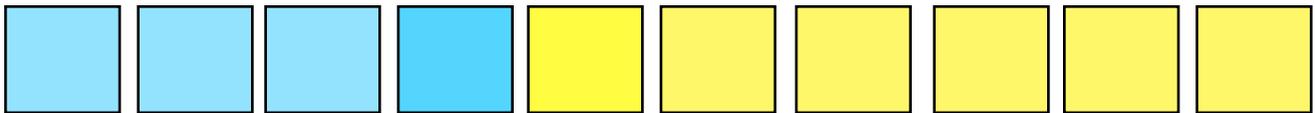
Let's pause for a moment to breathe and think. When we Play Math, we are enhancing our child's ability to **THINK**. Children need to have the confidence and skills to play with numbers and explore their meaning to enhance their conceptual understanding of math. Knowing one's "Times Tables" is not enough. The rote memory needs to have meaning.

In the following example we see that with the common core standards children are being asked to "explain" their answers, which is wonderful! The challenge is in many classrooms, children are not being taught how to decompose and think about math, so they do not have the verbal or written skills to express "How did you get that answer." We can improve conceptual math by playing with the Unifix blocks.

When we SEE IT we UNDERSTAND IT



One of the biggest challenges with math as it is taught in the early grades in America, is that children are taught calculations without understanding the meaning of math. When children begin to learn that $4+6 = 10$, they do not see 10 as:



Here is a parent note from a math blog Dr. Martin Fletcher sent me.

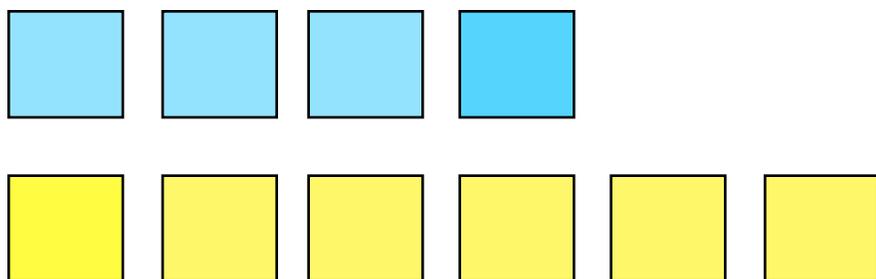
“They implemented Common Core this year in our school system in Tennessee. I have a third grader who loved math and got A's in math until this year, where he struggles to get a C. **He struggles with "explaining" how he got his answer after using "mental math."** In fact, I had no idea how to explain it! It's math $2+2=4$. I can't explain it, it just is.”

We empathize with this parent's struggle, for he was not taught that numbers are composed of other numbers. So it's hard for him to show his child. But with our Unifix blocks, we can show the children that numbers are made of other numbers. Here we are doing simple addition but wait until the children express delight as they see that multiplication and division are the inverse. This ah-ha moment changes the trajectory of their math experience.

Mental Math as VISUAL MATH!

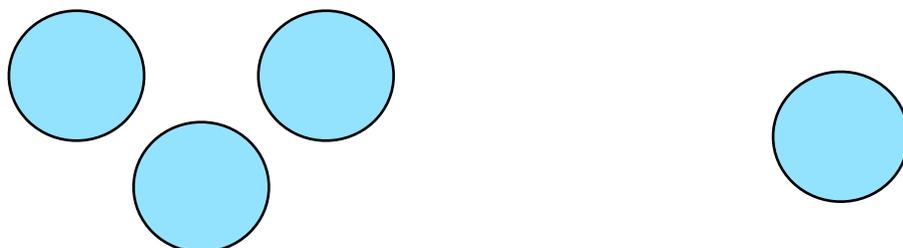


In Play Math, we love mental math for one specific reason, holding numbers in your working memory improves brain function. We do want children to work with numbers in their frontal lobes, but first we want them to have a visual image they can hold and manipulate. This seems simple because we are doing addition but multiplication is addition, it's simply fast addition.



Instead of asking a child to add $4+6$ in his head, we want to ask him to “SEE” $4+6$ in his head and then count it. In Play Math we love blocks, but circles are pretty cool as well.

Here's another great concept. Subitizing “to know instantly.” Using “subitizing” the child begins to group numbers to “see” them in his head. To read more about subitizing visit Ken's Math. www.kensmath.com/kens-math-program/subitizing

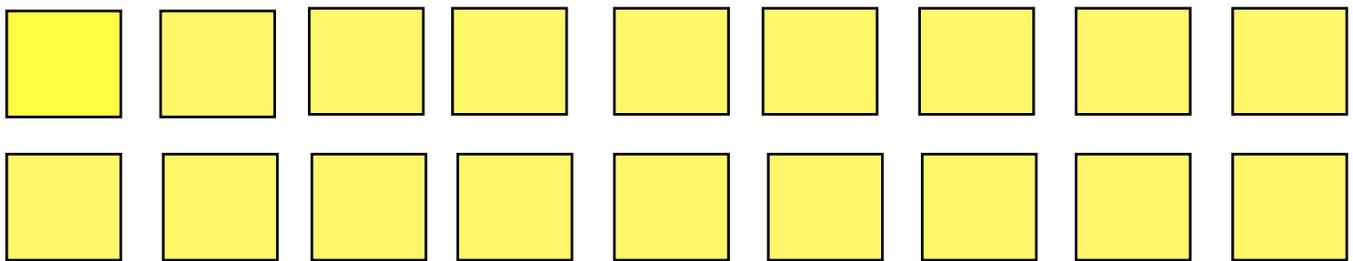




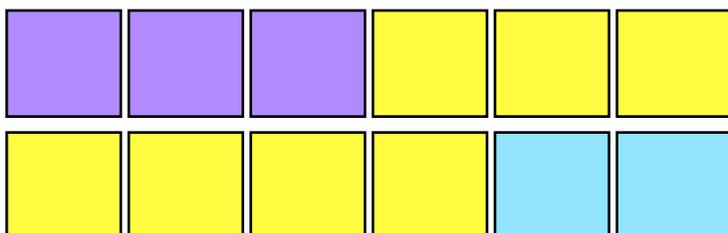
Mental Math as VISUAL MATH!

Let's see one more cool concept before we go to the "Over and the up."

After children are able to "see" the meaning of numbers with blocks, we can begin to show them that multiplication is simply fast counting. When we build "rods" that is, "units" of numbers that are equal or "the same" we can show them that if we have one 10 and we add another ten we have "2 tens" or 20! PLAY with the blocks, make numbers move them around see what numbers make other numbers. [Play Play Play](#).



Below we have two 6's. How many "2's" fit into them? How many "3's" fit into them? Lay the blocks on top of one another to see "what fits."





over and up

Over and up

10's

say it

Wow, we have done well!
Let's start to see the squares and rectangles our numbers make.

Did you know that the three numbers make up every fact family, are always a square or a rectangle? It's true let's see.

Since we are playing with 10's lets see what three numbers make up two 10's. When we lay two 10 rods out we can count **two over** and **ten up**. We have a fact family of two ten and twenty.

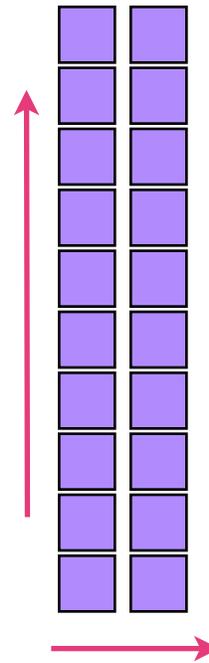
Over and up

10's

play it

Gather a few 10 rods and lay them on the marker board. Let the child arrange the rods together they will make a rectangle. In this example we

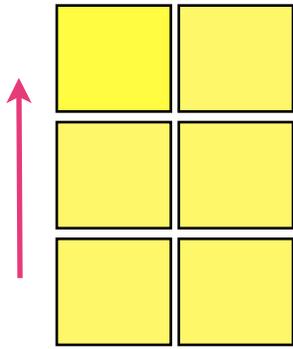
have 2 over and 10 up.
 $2 \times 10 = 20$.



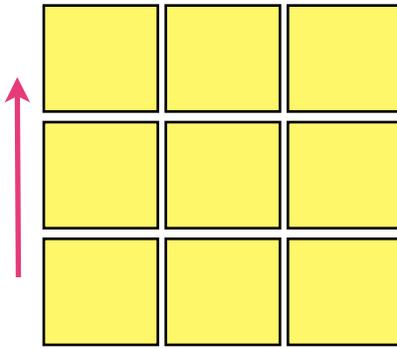
By alternating fine and gross motor movement with cognition, you are beginning to use the cortico-cerebellar loop. Using movement with thinking helps the number concepts to enter the brain on novel neuronal pathways, leading to better memory for number concepts.

more over and

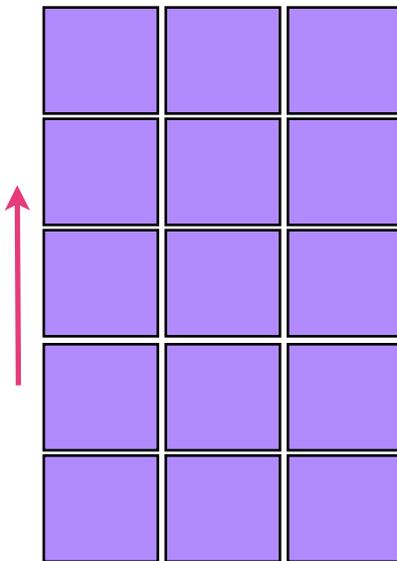
Up ~ so you can get
the hang of it.



$$2 \times 3 = 6$$



$$3 \times 3 = 9$$



$$3 \times 5 = 15$$

review of words and actions



This time, we'll use 2's then 4's, the numbers are all interchangeable, it's your enthusiasm that counts:).

Mirror or Skip Counting

Skip counting introduces children to addition, subtraction, multiplication and division. We begin every session skip counting with large kick balls, beach balls or tennis balls. The children rely on the consistency of this activity.

Rhythmic bouncing is easiest, but kicking the soccer ball, skipping rope or base running can be fun as well. Use your creativity!

CONCEPT	VERBAL MESSAGE	ACTION
<p>Skip counting is adding fast. Adding fast forward is multiplication. Subtracting fast backward is division.</p>	<p>“Let’s skip count.” For mirroring ~ “I’ll say a number and you say it back to me.” For learners who do not need mirroring ~ “I’ll say a number and you tell me what number is next.”</p>	<p>Choose your number 2,3,4,5,6,7,8,9, 10,11,12 Bounce the ball back and forth mirror or skip counting.</p>
ACTIVITY	WHAT YOU DO	WHAT YOU SAY
<p>We begin each session counting forward. After our confidence building 10’s and 5’s, we move on to 2’s 3’s 4’s and beyond. We try to finish a number through 12’s before we move to a new number.</p> <p>When the kids are proficient we skip count backward as well. That’s super fun and great for executive function skills.</p>	<p>For two people you stand across from one another six feet apart. For three people stand in a triangle for four people stand in a square.</p> <p>You bounce the ball rhythmically from one person to the next skip count the number to the number x 12.</p> <p>For mirroring 2’s, it is: 2,2,4,4,6,6,8,8,10,10 and so on.</p> <p>For standard skip counting it’s: 2,4,6,8,10,12,14,16,18,20,22,24</p>	<p>“Let’s skip count...”</p> <p>2’s 3’s 4’s 5’s 6’s 7’s 8’s 9’s 10’s 11’s 12’s extra credit 13’s 14’s 15’s</p>

Slide and Glide

The **Slide and Glide** is the motor method we use to move the blocks from the left side of the marker board to the right.

Simply show your child how to hold the block in one hand on board with his/her forefinger and thumb. Now slide the blocks as you count them.

CONCEPT

Number relationships can be seen by building.

VERBAL MESSAGE

"We got stuck on 4's, we made it to 16. We counted 4 4 times and got to 16, let's build more."

ACTION

Let the child create fours with the blocks. Place a few of them on a flat surface like the white marker board. Now Slide and Glide as you count. Take your time, model, have fun be playful not pushy:).

ACTIVITY

The child slides and guides the number they are on, in this case 4's.

It is very important that the children touch the blocks and move them as they count. The tactile aspect of Play Math is central to engaging the brain loop from cerebellum to cortex.

WHAT YOU DO

Let the child choose and move the blocks. When we count we slide the blocks over with our thumb and forefinger on either side of the block.

The children count 4, 8, 12 if they then say the wrong number like "15" we say "Let's count how many ones we have." The children then touch the individual units on each four counting 13,14,15, 16.

Now we go back to the 3rd 4 block and say "12", then move the 4th block "16".

WHAT YOU SAY

Our prompts are positive and encourage exploration.

"Let's count."

"Let's see how many we have."

"We have three 4's, how many is that?"

"So when we have three 4's we must have 12 ones."

"Let's slide the blocks back and count it again."

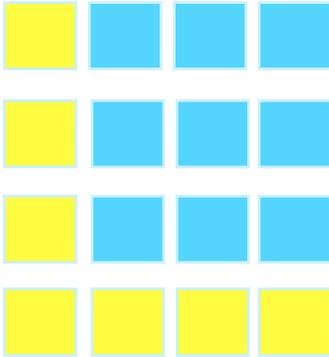
When the children feel they have mastered the fours we get up and use the balls again.

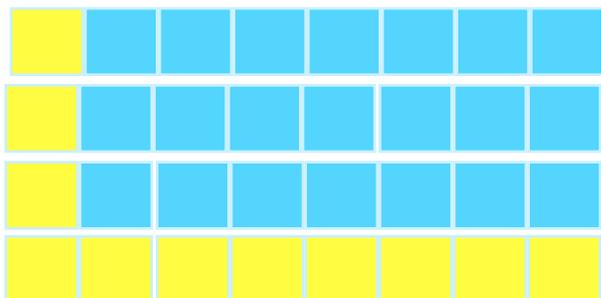
Great work! Let's Bounce The Numbers Again

We are now alternating between the gross motor activity of bouncing the balls and the fine motors activity of counting the blocks.

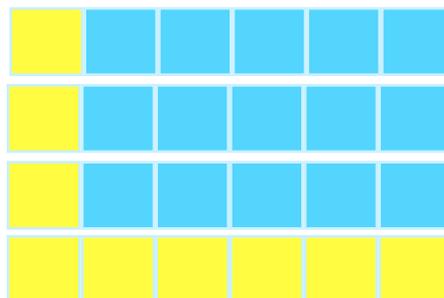
CONCEPT	VERBAL MESSAGE	ACTION
<p>We have now seen, counted and moved the blocks (see, touch, say, play, build). We can now go back and reinforce what we saw bouncing the balls.</p>	<p>“Great job! That was so fun. Let’s hear what it sounds like when we bounce the ball back and forth. You can start.”</p>	<p>Hand the kick ball to the child. You can do this with two people up to four. For two people we stand across from one another, with three people we make a triangle, with four people we make a square.</p>
ACTIVITY	WHAT YOU DO	WHAT YOU SAY
<p>Bounce the kick ball to one another counting the numbers, in this case we are counting 4's. In a few sessions, you will be up to 9's.</p> <p>Continue alternating bouncing the kick ball and sitting down to move the blocks as the child(ren) begins to see and hear 4. 8. 12. 16 etc.</p>	<p>Alternate gross motor movement and building with the blocks to teach skip counting, number relationships and multiplication.</p> <p>Always start with bouncing, throwing or kicking the ball. When the children get “stuck” ask them to build math with the base ten blocks, so they can see the relationships between the numbers.</p> <p>If the kids get bored let them teach you. They are super creative with their movement ideas!</p>	<p>“Okay, we’re ready. Let’s hear it.”</p> <p>“4,8,12,16,20,24,28,32,36,40!”</p> <p>“Extra credit! 44, 48, great you counted fours up to 4 x 12!”</p> <p>“Wow, you built fours, you saw fours, said them and skip counted them, them ~ great work!”</p> <p>“How cool, skip counting is just adding fast!”</p>

Over and Up

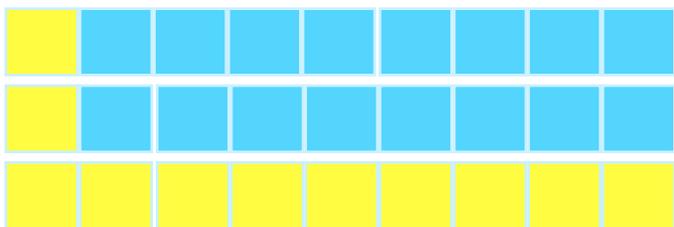
CONCEPT	VERBAL MESSAGE	ACTION
<p>This concept is from mathematicians. It is super effective. It shows the children that skip counting is multiplication.</p>	<p>“This is really cool ~ Every time you work with fact families or factors, they always create either a square or a rectangle.”</p>	<p>Arrange the base ten blocks in a square or rectangle and show the children that when they count the over and the up numbers, they can see how many ones are in the array.</p>
ACTIVITY	WHAT YOU DO	WHAT YOU SAY
<p>Show the children that skip counting is multiplication. Continuing to use 4's as our example. When the children slide and glide 4 4's as an example, you can show them the over and up numbers to see that they can calculate there are 16 in the array.</p>		<p>“You made a square. it has four 4's.” “When we count the ones across the bottom and up the side we can see there are four 4's. It tells us $4 \times 4 = 16$.” “Can you see it?” “Let's add a four and count the over and the up numbers.”</p>



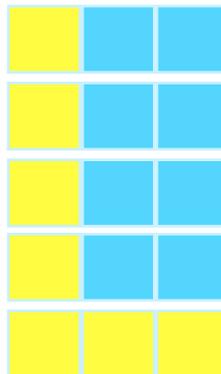
“We can touch eight 4’s.”
 “We slide and glide 4’s eight times.”
 “So how many ones do we have when we slide 4’s eight times?”



“We can touch six 4’s.”
 “We slide and glide 4’s six times.”
 “So how many ones do we have when we slide 4’s six times?”



“We can touch nine 3’s.”
 “We slide and glide 3’s nine times.”
 “So how many ones do we have when we slide 3’s nine times?”



“It works this direction as well.”
 “We can touch three 5’s.”
 “We slide and glide 5’s three times.”
 “So how many ones do we have when we slide 5’s three times?”



SKIP COUNTING 101

2's ~ 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30

Kids will progress up to 100.

3's ~ 3, 6, 9, 12, 15, 18, 21, 24, 27, 30, 33, 36

4's ~ 4, 8, 12, 16, 20, 24, 28, 32, 36, 40, 44, 48

5's ~ 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60

Kids will progress up to 100.

6's ~ 6, 12, 18, 24, 30, 36, 42, 48, 54, 60, 66, 72

7's ~ 7, 14, 21, 28, 35, 42, 49, 56, 63, 70, 77, 84

8's ~ 8, 16, 24, 32, 40, 48, 56, 64, 72, 80, 88, 96

9's ~ 9, 18, 27, 36, 45, 54, 63, 72, 81, 90, 99, 108

10's ~ 10, 20, 30, 40, 50, 60, 70, 80, 90, 100, 110, 120

11's ~ 11, 22, 33, 44, 55, 66, 77, 88, 99, 110, 121

12's ~ 12, 24, 36, 48, 60, 72, 84, 96, 108, 120, 132, 144

13's ~ 13, 26, 39, 52, 65, 78, 91, 104, 117, 130, 143, 156



so, i think you have it now. that's a simple start.

play math is motor math.

We engage the cortico-cerebellar system to learn math fact families through movement. It's five simple steps. You can work through each number's fact family sequentially. Take your time, make sure the child has the skill set down for a specific family of factors, then move on. On days or in moments where the child wishes to be creative please let them. The "being the teacher" and "mentoring" others aspect of this program is robust! Division is simply the inverse of multiplication so play around with that too.

At the outset I mentioned [The Austin](#) and [The Kyle](#). One of the greatest joys of this work, is when one of the students comes up with a new and interesting way to learn conceptual math, I tell the children that their creativity matters. When they come up with an activity *we name it after them*.

[The Austin](#) is when the children stand in a triangle or square and go through math symbology in words. It sounds like this:

"Three times four equals twelve." "Four times three equals twelve." "Twelve divided by three equals four." "Twelve divided by four equals three." Each child says the next computation as they bounce the ball to the next person. In the Austin, we always begin with the smallest number. In this case it is three.

[The Kyle](#) can actually be seen in our [Play Math video](#). The one we did to secure funding to go into the inner city and build a math mentoring program. <http://vimeo.com/40715519>

What the children do is run from the starting line up to their own polyspot. On the polyspot is a number written with an expo marker. Each child has a different number on their polyspot depending on their fluency and skill sets. Each child then turns over a card and multiplies (or in the case of our newer learners adds or subtracts) the number on the card with the number on the polyspot. They write the equation or the number on the marker board and run back to the starting line.

Children love drawing and writing on the marker boards as well. It's easy to incorporate writing numbers, equations and getting creative after the initial skip counting and slide and glide becomes habitual.

The valuable aspect of the children teaching and mentoring one another is that we can teach thousands of children this method three by three. If I teach three people and you teach three people we have a math revolution:). *We hope you are engaged and inspired. I appreciate your caring.*

With joy,

Dr. Lynne