designing, selecting, implementing and advocating
to support mathematics skills in learners
with Down syndrome

working together to

MAKE MATH HAPPEN

Elements for Making MATH Happen

Responsibilities of parents, general education teachers AND special education teachers

Stages of Number Sense

Knowing HOW brains acquire number sense equips you to design supports to compensate for missing stages UNTIL those skills are acquired.

Number sense trajectory informs state learning outcomes and most curriculums.

SNAPSHOT : STAGES OF NUMBER SENSE

SUBITIZING-Assigning a name to a visual pattern
Recognizing a quantity WITHOUT counting

COMPARISONS- Using subitizing to identify a difference between quantities

ROTE COUNTING-Reciting a sequence of names *KINDERGARTEN PRIORITY*

I:I CORRESPONDENCE-Requires counting AND producing

CARDINALITY- Also requires counting and producing
The final number said is the quantity of the set.

Hierarchical Inclusion: If you have 5 apples, you also have 4 apples within that group of 5.

NUMBER CONSERVATION-
The number in the set is NOT changed by the arrangement of the items within the set.

Meaningful Math Supports

There are NO magical manipulatives. Knowing the characteristics of effective supports allows you to choose supports wisely and successfully design your own.

Meaningful use of supports should be addressed by goal setting and progress monitoring

SHOW ME ALL YOUR EIGHTS

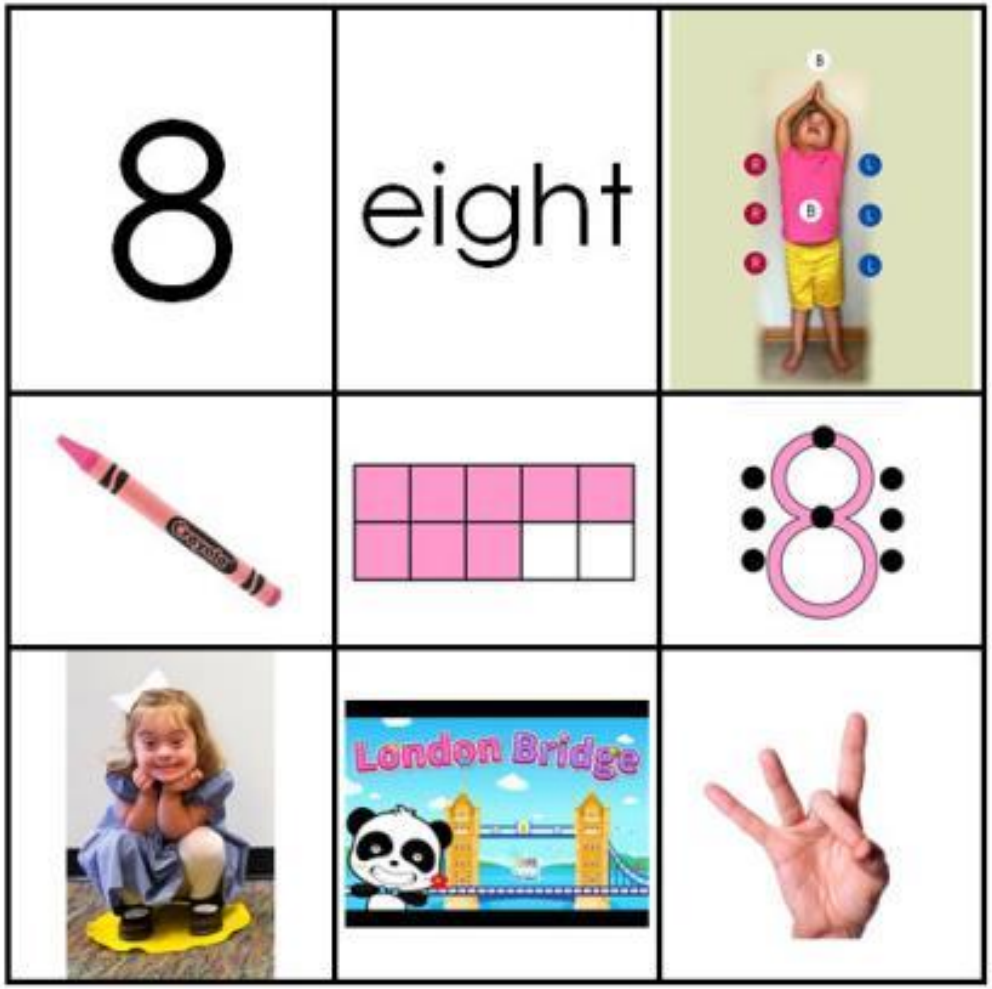
Maximize the likelihood of correct responses by increasing the number of correct response options.

Using multiple examples of a number also reinforces multiple number sense concepts.

MULTISENSORY = MORE ways to show what you KNOW

8

eight



Kinesthetic counting by tens…

JUST STICK TO THE MATHS

Effective supports minimize the impact language skills or fine motor skills may have on learning or performing math tasks.

When faced with choosing between efficiency and accuracy, go with accuracy. Every time.

KEEP DOING WHAT YOU DO

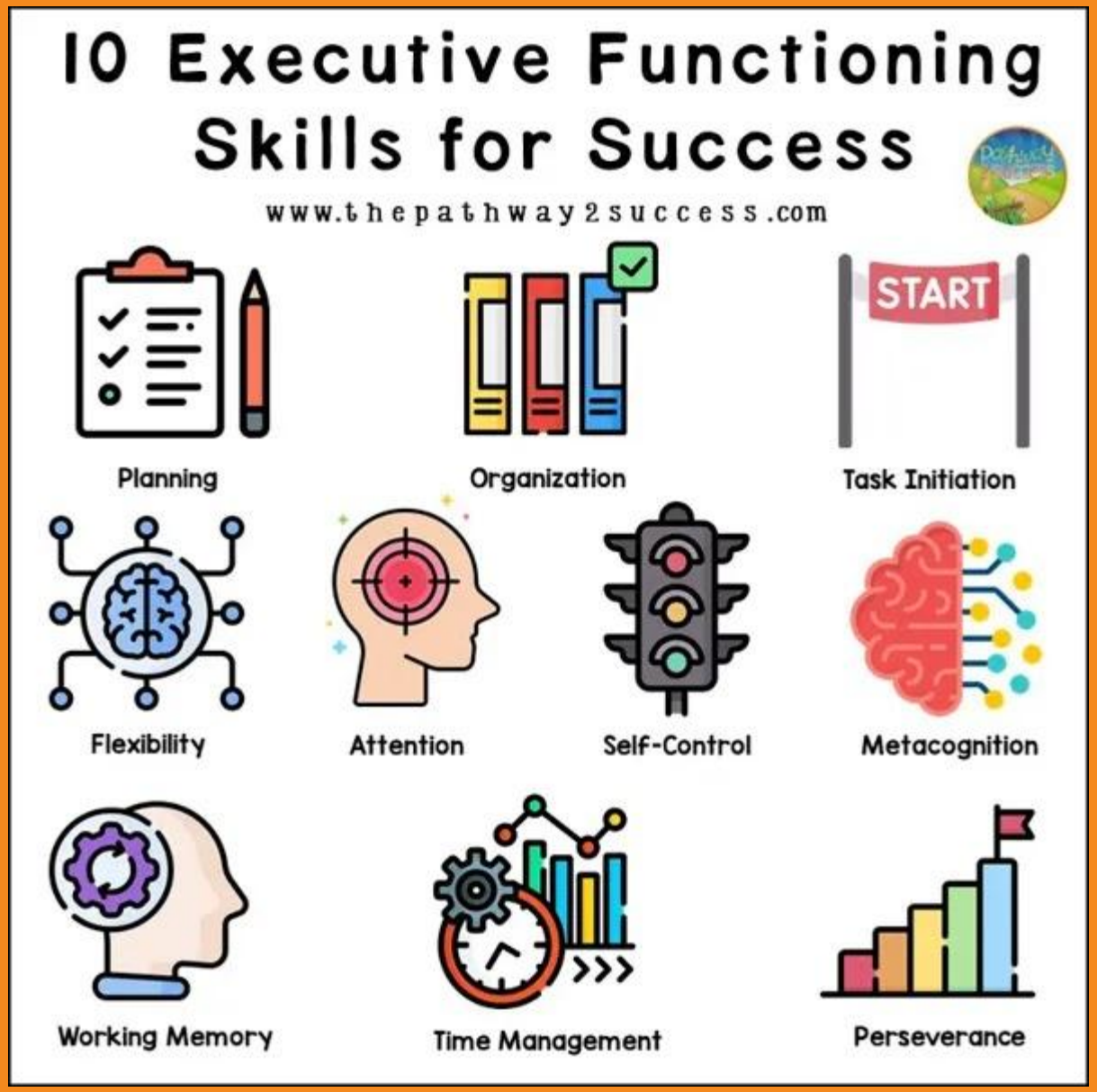
An effective support will be able to be used, in its original form, for more complicated math processes.

Teach the concept by directly teaching the tool.

Relationships between supports will reinforce relationships between mathematical concepts.

JUST STICK TO THE MATHS

Effective supports minimize the impact executive function deficits may have on learning or performing math tasks.



Math performance is more impacted by **executive function deficits** than number sense or computation deficits.

Supports are Shared Brain Space

- Numeral Lines
- Quantity Lines
- Fact Family Pattern Charts
- Multiplication Charts
- Pre-printed Numeral Manipulatives
- Multi-step Procedure Maps
- Graphic Organizers

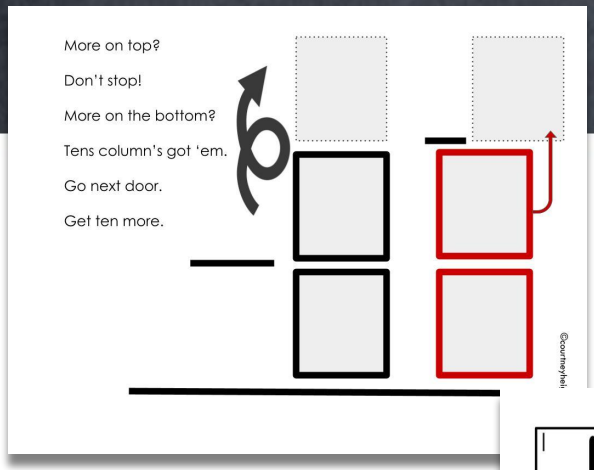
Task initiation? Perseverance? Attention?
How can you tie practice or support to natural motivators?

Tools that aren't used don't work.

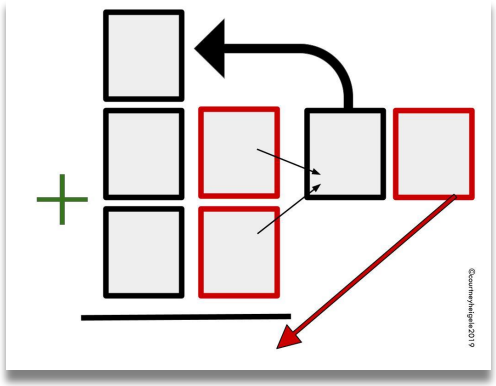
USE “CAN” TO GET TO “CAN’T YET”

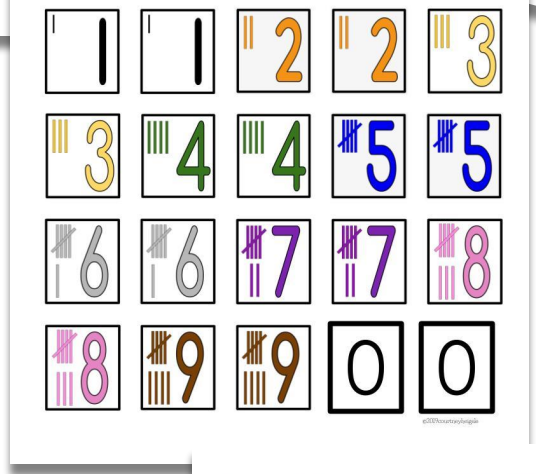
The patterning and repetition involved in math make it possible to use foundational number sense to facilitate more complicated math processes.

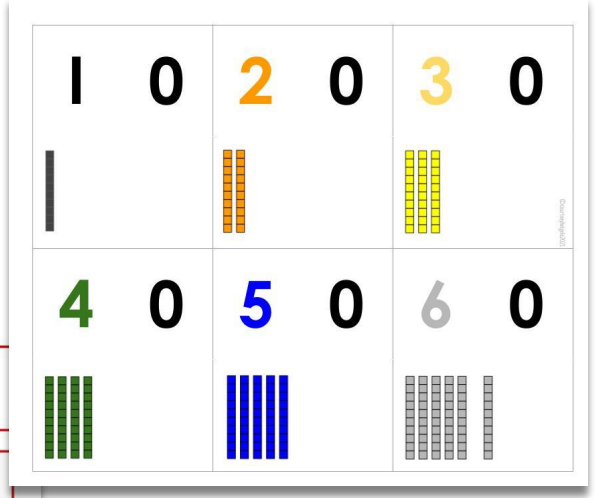
Look at what she is using meaningfully to support adding and ask “How would this look in division?”


More on top?
Don't stop!
More on the bottom?
Tens column's got 'em.
Go next door.
Get ten more.


7 x



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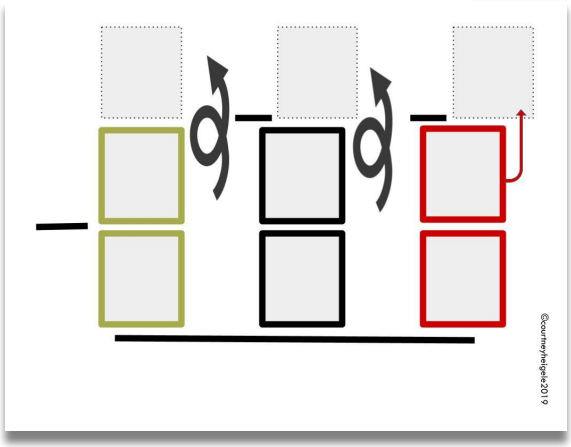
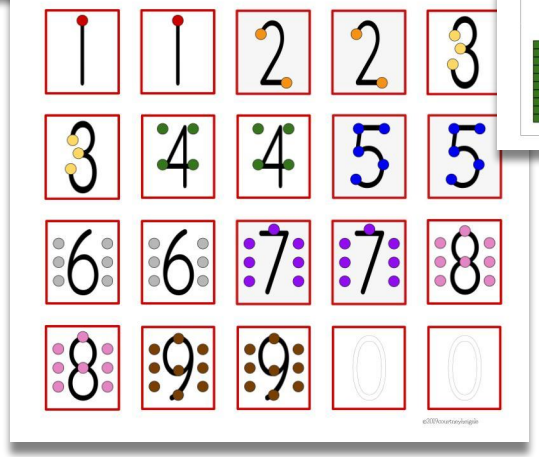
2 0
3 0
4 0
5 0
6 0





STICK WITH WHAT WORKS

SUBTRACTION

ADDITION WITH REGROUPING

MULTIPLICATION

COUNTING CURRENCY

THE IMPORTANCE OF ADVOCACY

Math cannot happen in a vacuum. Students must see their tools modeled and meaningfully used wherever math is happening in their world.

Advocacy is communication, generosity, collaboration and potential humiliation.

ADVOCACY is in the **ACCOMMODATIONS**

"When presented with the task of combining or decomposing numbers, Jace will have access to pre-programmed manipulatives simultaneously depicting color-coded numerals and tactile quantities for digits 0-9 and an enlarged graphic organizer to establish visual spatial boundaries for equation building and directionality for the solving process."

THIS IS WHY WE SHOW UP TO THAT MEETING WITH DONUTS, PEOPLE.

ADVOCACY SHOWS UP IN GROUPS OF 20

Stop preparing the kid to perform in the general education classroom and START preparing the general education classroom to support the kid immediately upon her arrival.

Why the first rule of support design is: YOU CAN MAKE IT CHEAP.

HELICOPTERS vs. HONEY

- “These are the manipulatives Geb’s IEP says he’ll use during math. You’re legally required to make sure he has them at math time.”
- “Geb knows how to use these tools to support accuracy when he’s doing computation. I made a set so any student could use them, too. Show me where you keep student math tools and I’ll put them there.”

HELICOPTERS vs. HONEY

- “Special education staff will support Geb in using his individualized tools in the grade level classroom for whole group instruction time.”
- “Can I volunteer in your room for 15 minutes daily/weekly to do some whole group multisensory activities that will support the math content you’re working on during this quarter?”

HELICOPTERS vs. HONEY

- “Geb won’t usually bring homework. We tend to complete it during his service times with the tools he uses at school.”

- “I emailed a video showing Geb using his tools with support. In his backpack you’ll find a set of the tools to keep at home and a similar activity page. Please watch the video together and attempt the activity and let me know in his communication notebook how it goes.”

Elements for Making MATH Happen

Responsibilities of parents, general education teachers AND special education teachers

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Rarely Pretty is the name I use for publicly sharing resources, Boom cards, etc.

Questions?
Ideas?
Tips?

THANK YOU!!!