Materials

Place Value Discs

Dice

Subitizing Plates

Poly dots

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Meaningful Movement in Math

Number Sense in Daily Routines

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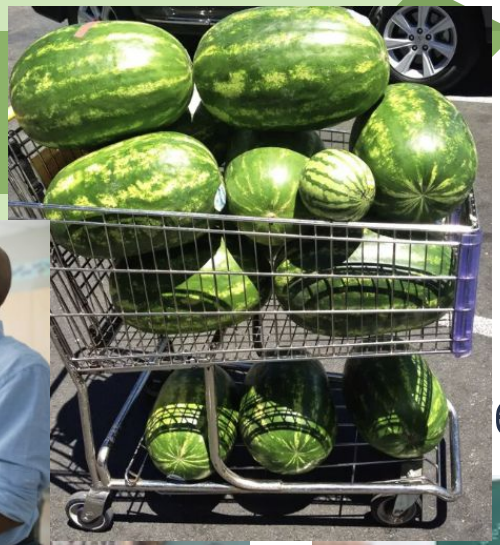
Fast Fingers!

What is your math autobiography?

Think Pair Ba

- 1 Minute

as p



"Who is putting all the Math books in the Horror section?"

Find the sums.

3 + 3 =	7 + 9 =	2 + 3 =
9 + 9 =	1 + 1 =	10 + 10 =
9 + 11 =	5 + 5 =	8 + 8 =
8 + 10 =	7 + 7 =	6 + 6 =
2 + 4 =	11 =	6 + 8 =
7 + 8 =	=	+ 6 =
2 + 2 =	6 + 7 =	1 + 3 =
3 + 5 =	4 + 5 =	8 + 9 =
3 + 4 =	1 + 2 =	5 + 7 =
9 + 10 =	5 + 6 =	10 + 12 =
7 + 8 =	4 + 4 =	5 + 5 =
5 + 5 =	6 + 8 =	7 + 7 =
9 + 9 =	3 + 5 =	3 + 4 =
4 + 5 =	7 + 8 =	9 + 11 =

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Let's get creative!

Which one doesn't belong?

- Think Pair Share with your partner
- High Five each time and switch!
- How many ways can you come up with?

Top Right

Top Left

Bottom Right

Bottom Left

Learning Intentions & Success Criteria

Learning Intention:

- We are learning to incorporate meaningful movement strategies effectively into mathematics instruction to: enhance student engagement, understanding, and retention of mathematical concepts.

Success Criteria:

- I will know I am successful when I can speak to the cognitive benefits of movement and can advocate for more movement in mathematics instruction.

Terms Defined

Number Sense is the intuitive understanding of numbers and number relationships, starting with subitizing

Subitizing is the ability to instantly recognize the number of objects without actually counting them

Procedural Fluency is the ability to apply procedures efficiently, flexibly, and accurately

Impact of Dyslexia on Mathematics

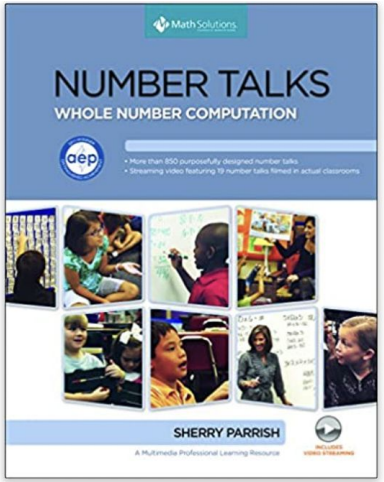
- Language and symbols in math
- Over 60% of individuals with dyslexia have difficulty with mathematics (Miles, 1993; Jefe, 1990)
- Math is objective….but not at the same time

-Code Red Network

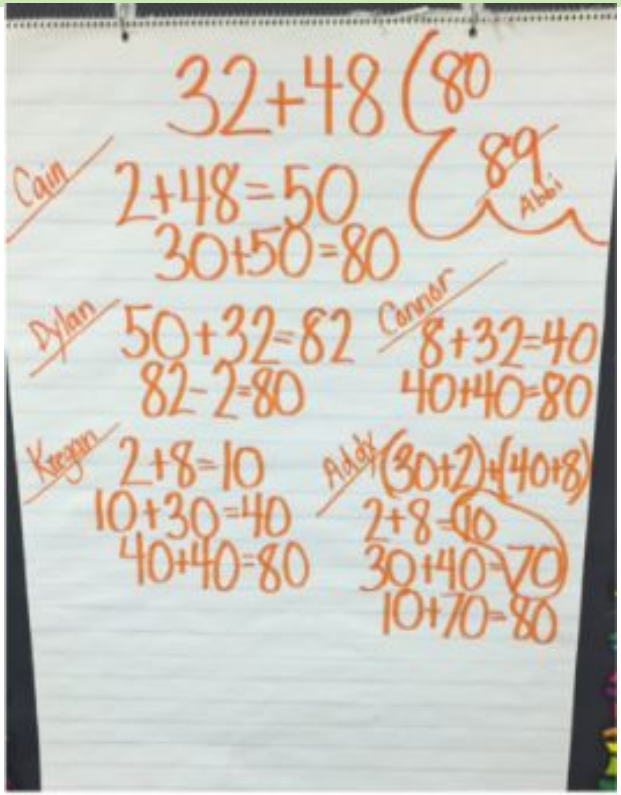
Fluency as Advocacy

"We need citizens who are able to discern whether numbers make sense and are applicable to specific situations and who are capable of communicating solutions to problems."

-Page 5 Number Talks



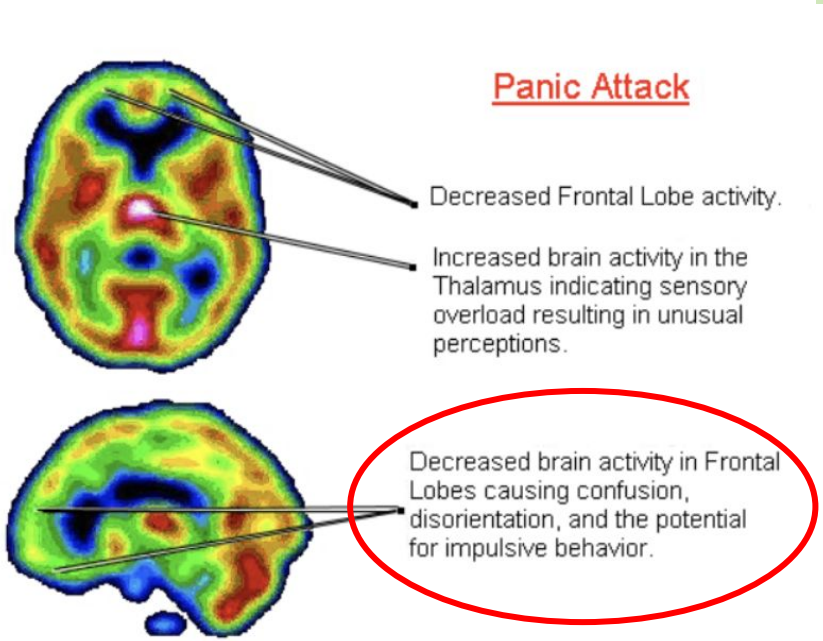
Fluency is the by-product of flexibility



Focusing on fast does not make kids flexible, but focusing on building flexibility does make them fast.

-Susan Jo Russell, 2000

Brain Imaging
Young, Wu, and Menon, 2012



Researchers discovered that students who felt panicky during math had increased activity in the brain regions associated with fear and decreased activity in the regions associated with problem solving.

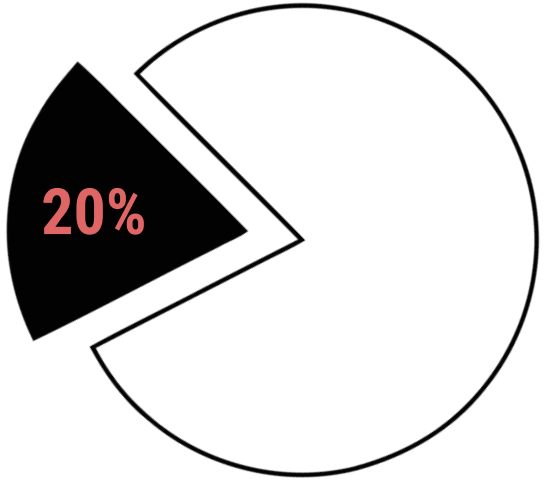
What are the effects of this on our students developing a mathematics identity?

Impact on Behavior -Johnston et al., 2018

Academic Frustration

- Difficult work and instruction
- Even when desire to succeed is present

Classroom Misbehavior

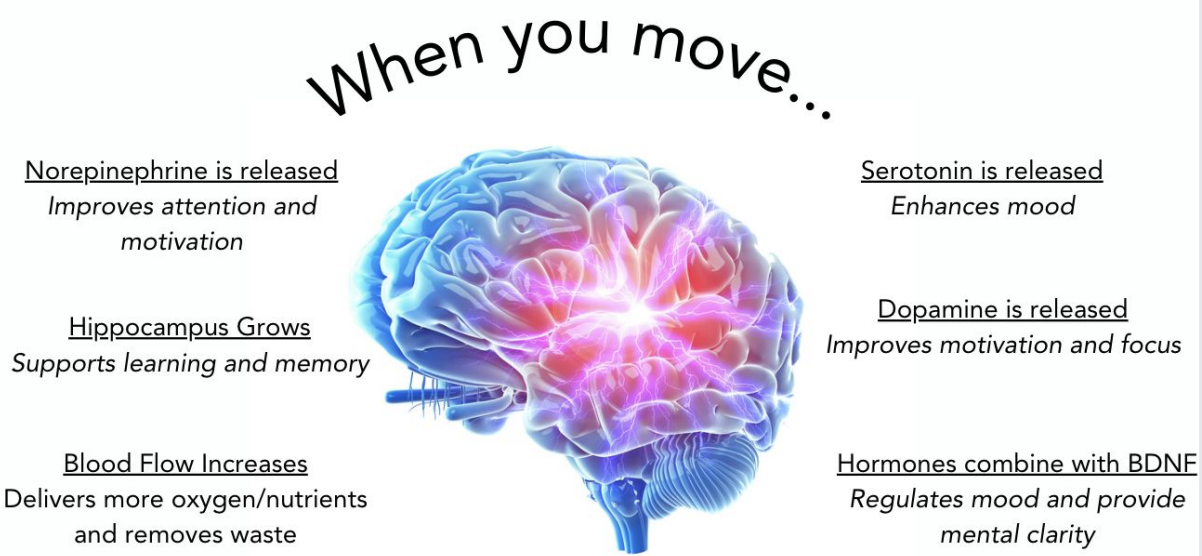


How can we build in more opportunities to check for understanding as well as safe places for students to engage in the learning process?

Why Movement?

Movement activates our brain!

- ✔ Increase Norepinephrine = Increased ability to focus and capacity of working memory
- ✔ Increased circulation = Brain gets blood flow and oxygen.
- ✔ Release Serotonin = Increased memory and attention
- ✔ Release Dopamine = Supports working memory
- ✔ Increased Glucose = Improved mood, attention, and cognitive and behavioral flexibility



Brain Boost vs. Break

Boost	Break
Instructional strategies that incorporate movement into learning ● Games that review content ○ Four Corners ○ This or That ● Fast Fingers	Short, structured mental breaks that support natural cognitive function ● Take a hike (sort of) ● Dance party ● Calm down strategies

Why Number Sense?

Children with good number sense **enjoy playing with and exploring numbers** and number relationships. As a result of these strategies, they can often find the most efficient solution to the problem.

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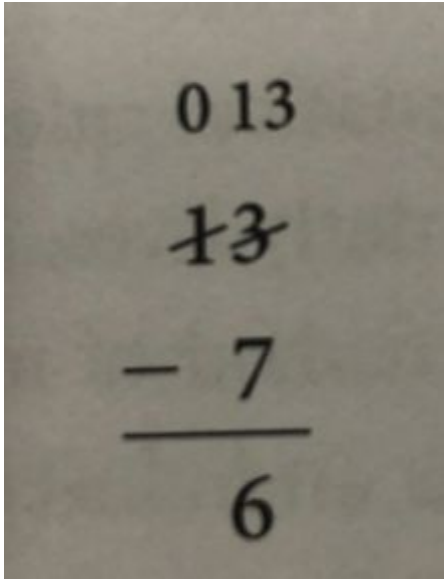
What does poor number sense look like?

- Focus on procedure
- Inefficient strategies
- Failure to identify connections to get to the answer more efficiently
- Become frustrated with math concepts quickly
- Struggle to estimate effectively



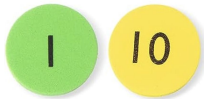
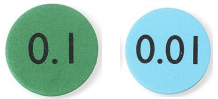
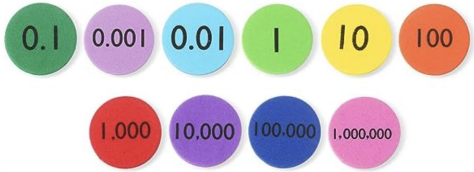
Adapted from Judy Hornigold

How do we build Number Sense?

Number sense develops over time through opportunities to explore and play with numbers.

- Visualising numbers in different contexts, spotting relationships between numbers and predicting the patterns all contribute to good number sense.
- Embedded in daily routines.

Place Value Game Using Place Value Discs

Grade Level	Standard	Resources
K	K.NBT.1	
1st	1.NBT.2, 1.NBT.3	
2nd	2.NBT.1	
3rd	3.NBT.2	
4th	4.NF.6, 4.NF.7	
5th	5.NBT.3, 5.NBT.4	

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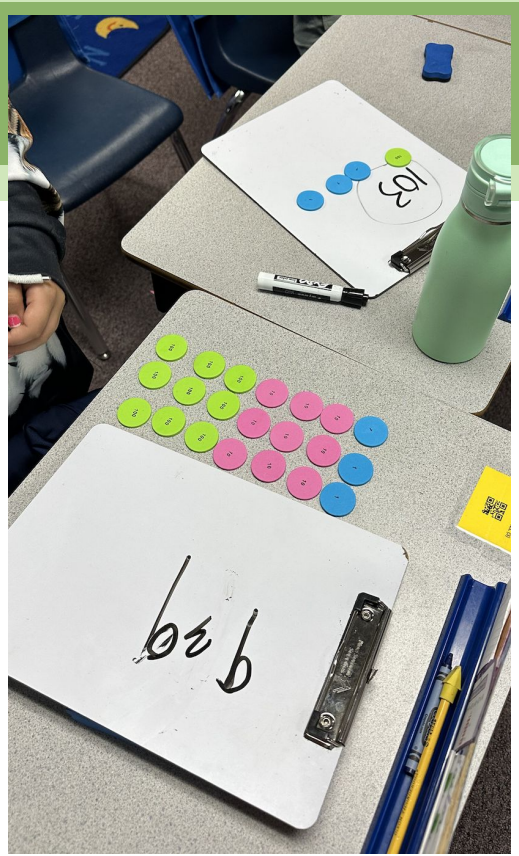
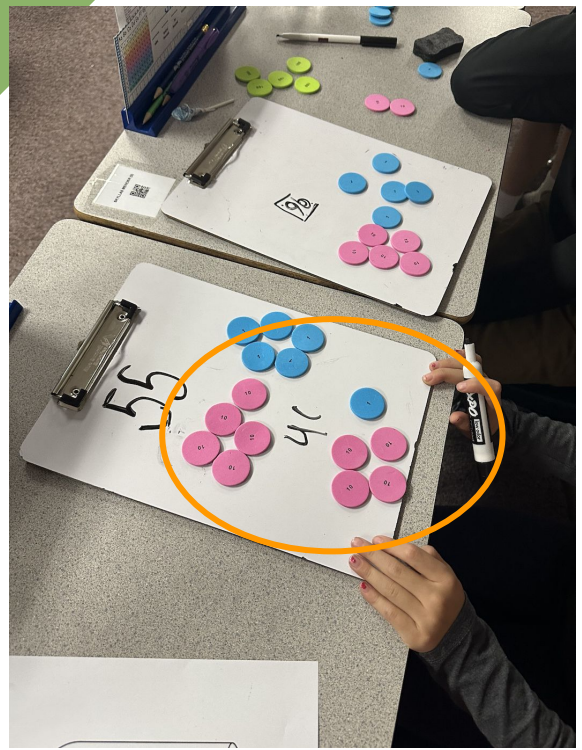
Partners

- Retrieve correct place value disks
- Checks work





Partners

- Choose and compare numbers

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Let's Play!

Find your Fast Finger Partner

- Play RSB to determine who is finding disks first
- Once you see the number, go find the disks and bring it back to your partner
- Your partner checks your work
- Switch roles for the next number

12

12

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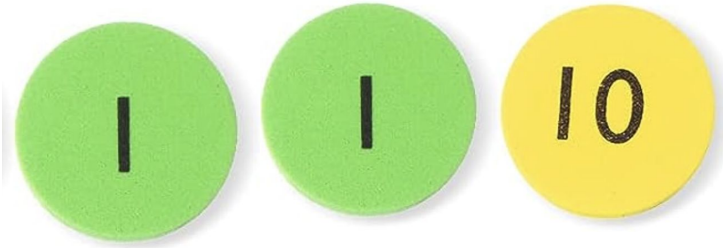
123

123



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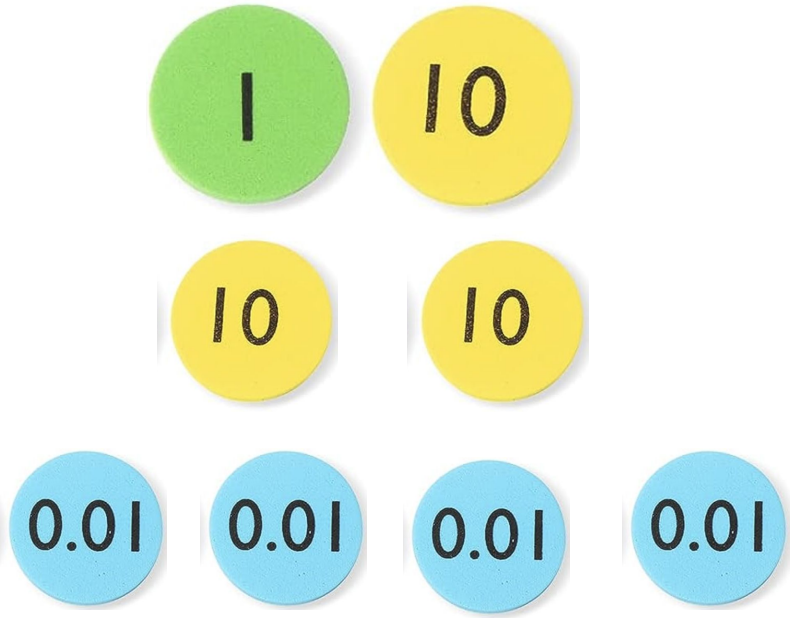
31.04

31.04



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Place Value Game Using Place Value Discs

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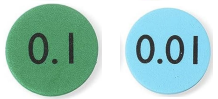
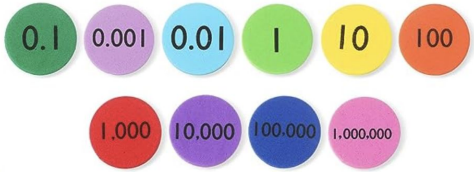
4th	4.NF.6, 4.NF.7	
5th	5.NBT.3, 5.NBT.4	

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1st Grade 8-4

Solve the problem below any way you choose.

6. **Number Sense** Bill writes a number. It has the same number of tens and ones. What could Bill's number be?

_____

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5th Grade 1-2

18. **Higher Order Thinking** Dan wrote $(2 \times 10^6) + (3 \times 10^4) + (5 \times 10^3) + 4$ for the expanded form of two million, three hundred fifty thousand, four. What error did he make in the expanded form? What is the standard form of the number?

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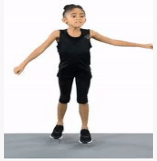
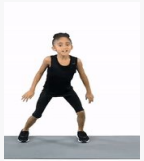
Building Movement into Activities-BFF Games

Addition/Subtraction Example: If your number is… choose one motion

1	or		4	or	
2	or		5	or	
3	 or		6	 or	

Number Match (6-Sided Dice)

4	2	3	4	1
3	1	4	2	5

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Dogs

Cats

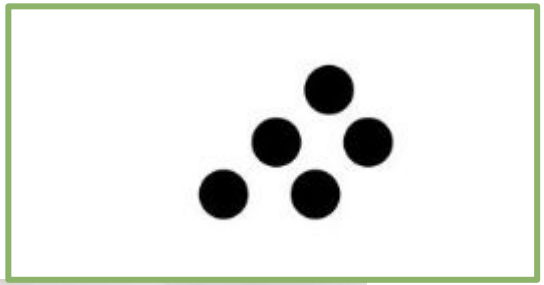
Squats

LUNGES

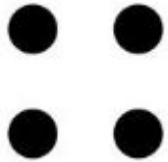
DO ⬆ THIS

DO ⬆ THAT

Which is greater?



OR



Which is less than?

32.05

OR

32.5

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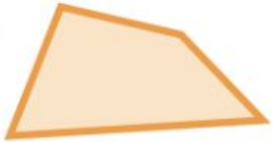
Chalk and measurement tools

Grade	Standard	Grade	Standard
K	K.MD.1: Measure K.G.2: Name shapes	3rd	3.MD.6: Measure shapes by unit squares
1st	1.MD.1: Length of object 1.G.2.a: Compose 2D shapes	4th	4.MD.3: Area and perimeter 4.MD.6: Measure angles 4.G.2: Classify two dimensional figures
2nd	2.MD.1: Measure length of object (right tool) 2.MD.2: Measure with different units 2.MD.3: Estimate length 2.G.1: Recognize and draw shapes	5th	5.MD.1: Convert measurements 5.G.4: Classify two dimensional figures

1st grade 13-1 and 14-1

Tell how many sides and vertices. Name each shape.

2. 

____ sides

____ vertices

Shape: _____

3.

____ sides

____ vertices

Shape: _____

4. Draw a closed shape with 3 vertices.

5. Draw a closed shape with 0 straight sides.

6. Draw a closed shape with more than 3 vertices.

3rd Grade 15-2

18. **Higher Order Thinking** Jessalyn needs to find 3×3, 4×6, and 7×2. She draws area models to solve the problem. What polygon group do her area models all belong to? Explain.

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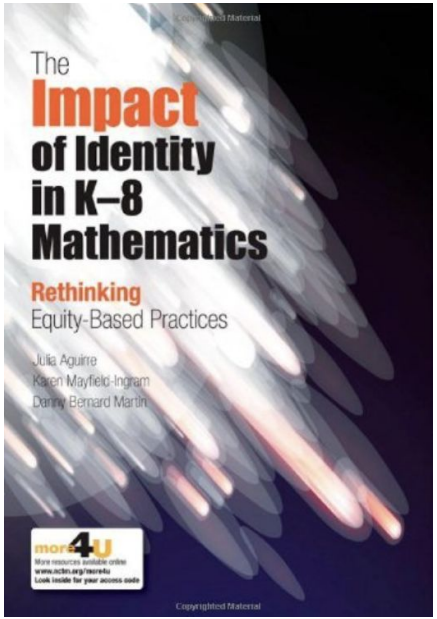
Life Sized Number Line using whole numbers and fractions or decimals

- Skip Counting (Literally)
- Place Value
- Adding/Subtracting using various strategies
- Greater than/less than

Reflect on Mathematics Identity

All students deserve to see themselves as mathematicians in our classrooms.

What can you integrate into your practice to increase the mathematics identity of your students in your instruction?



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Advocate for your students!

Encourages physical activity in classrooms to enhance learning

- Beyond PE and recess
- Brain breaks, stretches and energizers
- Integrate it into lessons

Physical Education and Physical Activity - 300.03-4

1. Physical education will be provided and promoted as follows:
    1. Each school will teach the physical education core in grades K-12. Physical education will be encouraged through physical education activities in other content areas, in the home and the broader community.
    2. Each school shall meet state standards for physical education for elementary and secondary education.
    3. Physical education instructors shall be trained and certified according to state standards
    4. Schools are encouraged to implement a variety of physical activity courses aimed at improving student confidence, fitness levels, motor and self-management skills (e.g., circuit training, weight training, dance, yoga, etc.).
    5. In addition to PE and daily recess, elementary licensed staff and educational support professionals (ESPs) are encouraged to provide periodic opportunities for physical movement in the classroom. The district will maintain a list of resources for brain breaks, stretches and energizers.

Learning Intentions & Success Criteria

Learning Intention:

- We are learning to incorporate meaningful movement strategies effectively into mathematics instruction to: enhance student engagement, understanding, and retention of mathematical concepts.

Success Criteria:

- I will know I am successful when I can speak to the cognitive benefits of movement and can advocate for more movement in mathematics instruction.

Resources

- GIF Movement Collection
- Subitizing Cards
- Place Value Discs

Guiding Documents and Research

- Utah's PK-12 Math Framework
- Impact of Identity in K-8 Mathematics
- Limitless Mind
- Building Fact Fluency Kit
- Number Talks
- Developing Computational Fluency with Whole Numbers
- The Neurodevelopmental Basis of Math Anxiety
- Why do Students Misbehave? An initial Examination of Antecedents to Student Misbehavior
- Code Red Dyslexia Network