

Beyond Memorization: How Math is Shaping our Learning Experiences

A Family Approach to Learning Math
Through Process, Language, and
Understanding



A Big Shift in How We View Math

In today's classrooms, the process tells us far more about learning than the final answer

From Product to Process

Old View of Math Instruction:

- Correct Answer = success
- One right way
- Speed and accuracy
- "Just tell me how to do it"



New View of Math Instruction:

- How you get there matters
- Multiple Strategies are valued
- Mistakes are part of learning
- Students explain their thinking



Why Process Matters More Than the Product



When children show their thinking, teachers can:

- See what a child understands
- Identify what strategies they are using
- Notice where misconceptions exist
- Decide what support is needed next

Two students can get the same answer-
but understand the math very differently...



Language is the Bridge to Understanding

Math Is a Language: Stronger Math Language results in Stronger Thinking

Illustrative Math builds understanding by developing: Math vocabulary

Compose — Decompose — Equal — Strategy — Equation

Sentence Frames:

Sentence frames to explain thinking

"I noticed...",

"I agree/disagree because...",





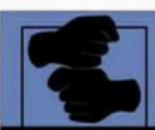

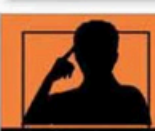

"This works because..."

Talk Moves provide multiple ways to communicate understanding: talking, drawing, modeling, writing

TALK MOVES

Talk Moves are designed to create a classroom culture where students are regularly expected to speak, listen, and respond to one another. Each gesture serves a different purpose in establishing and/or maintaining a dynamic conversation.

Introduce Talk Moves one at a time, giving students ample time to learn the hand signals, the sentence starters, and the cognitive meanings behind each one.

 ANSWER ▶ I have an idea... ▶ I'm thinking...	<p>"Thumbs up" is used to indicate that a student has had enough time to think and is prepared with an answer.</p> <ul style="list-style-type: none">▶ I've been giving it some thought...▶ I know what I'd like to say.▶ I'm ready to answer.	 REPEAT ▶ I can restate what he said. ▶ I heard say that...	<p>Rotating his index fingers, a student reveals he heard what a classmate said and can restate it.</p> <ul style="list-style-type: none">▶ I can paraphrase what ____ said.▶ I heard ____ at ____ said and can restate it.▶ I listened and can repeat it.
 CONFUSED ▶ Could you say that again? ▶ I don't understand.	<p>The raised arm and flat hand indicates a student is unsure of the question, the answer, or the content of the conversation.</p> <ul style="list-style-type: none">▶ HELP! I'm lost.▶ I'm not following the conversation.▶ I need someone to repeat and/or clarify what was said.	 AGREE ▶ That's what I was thinking. ▶ I was going to say that, too!	<p>With a thumb pointing at himself and a pinkie pointing to the speaker, a student can show agree.</p> <ul style="list-style-type: none">▶ I believe that as well.▶ That's the same answer I got.▶ ____ is on the right track.
 ADD ON ▶ I would add that... ▶ When ____ said that, it made me think about...	<p>Stacking fists represents that a student would like to add or build onto a peer's original idea.</p> <ul style="list-style-type: none">▶ In addition...▶ Building on what ____ said, I can add...▶ When ____ said that, it made me think about...	 SUPPORT ▶ In the text it states... ▶ I know that is correct because...	<p>Representing the pages of a triangle, students use their hands to reveal that they can offer proof or evidence.</p> <ul style="list-style-type: none">▶ For example,...▶ That's true because...▶ In fact,...
 DISAGREE ▶ I respectfully disagree with... ▶ Another way to look at it is...	<p>Tapping the head is a respectful way to indicate an alternative opinion or response.</p> <ul style="list-style-type: none">▶ I have a different thought.▶ I hear what ____ is saying, but what about...▶ I'm wondering about...	 CLARIFY ▶ I know what ____ means. He's saying... ▶ Another way to say it is...	<p>Forming a complete triangle with two hands symbolizes how one student can reiterate a peer's response more clearly.</p> <ul style="list-style-type: none">▶ He is saying that...▶ In other words...▶ I get it. ____ means that...

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Language is the Bridge to Understanding - Talk Moves

Talk Moves + Gestures = Access for All Learners

We intentionally use Talk Moves (supported by a shared poster and gestures) to strengthen student discourse:

- Repeat / Rephrase – hand cupped to ear
- Add On – one hand stacking on the other
- Agree / Disagree (with reason) – thumbs up/down + pointing to evidence
- Why? / How do you know? – open hands





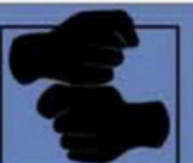



Gestures provide visual and physical support, helping all students, especially multilingual learners access and produce academic language.

Stronger math language equals stronger thinking!

TALK MOVES

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Introduce Talk Moves one at a time, giving students ample time to learn the hand signals, the sentence starters, and the cognitive meanings behind each one.

 <p>ANSWER</p> <p>I have an idea... I'm thinking...</p> <p>"Thumbs up" is used to indicate that a student has had enough time to think and is prepared with an answer.</p> <p>I've been giving it some thought... I know what I'd like to say. I'm ready to answer.</p>	 <p>REPEAT</p> <p>I can restate what he said. I heard say that...</p> <p>Rotating his index fingers, a student reveals he heard what a classmate said and can restate it.</p> <p>I can paraphrase what ____ said. I heard what ____ said and can revoice it. I listened and can repeat it.</p>
 <p>CONFUSED</p> <p>Could you say that again? I don't understand.</p> <p>The raised arm and flat hand indicates a student is unsure of the question, the answer, or the content of the conversation.</p> <p>HELP! I'm lost. I'm not following the conversation. I need someone to repeat and/or clarify what was said.</p>	 <p>AGREE</p> <p>That's what I was thinking. I was going to say that, too!</p> <p>With a thumb pointing at himself and a pinkie pointing to the speaker, a student can show agreement.</p> <p>I believe that as well. That's the same answer I got. ____ is on the right track.</p>
 <p>ADD ON</p> <p>I would add that... When ____ said that, it made me think about...</p> <p>Stacking fists represents that a student would like to add or build onto a peer's original idea.</p> <p>In addition... Building on what ____ said, I can add... When ____ said that, it made me think about...</p>	 <p>SUPPORT</p> <p>In the text it states... I know that is correct because...</p> <p>Representing the pages of a text, students use their hands to reveal that they can offer proof or evidence.</p> <p>For example... That's true because... In fact,...</p>
 <p>DISAGREE</p> <p>I respectfully disagree with... Another way to look at it is...</p> <p>Tapping the head is a respectful way to indicate an alternative opinion or response.</p> <p>I have a different thought. I hear what ____ is saying, but what about... I'm wondering about...</p>	 <p>CLARIFY</p> <p>I know what ____ means. He's saying... Another way to say it is...</p> <p>Forming a complete triangle with two hands symbolizes how one student can reiterate a peer's response more clearly.</p> <p>He is saying that... In other words... I get it. ____ means that...</p>

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What Math Learning looks Like Across Grades



Intermediate Grades: (2-3)
Students compare strategies and justify their reasoning.

Primary Grades: (K-1)
Students model, count, draw, and explain out loud.

Upper Elementary: (4-5)
Students defend solutions, revise thinking, and connect concepts.

Consistent Across All Grades:



Explaining thinking



Using precise language



Valuing multiple strategies

P.S 221's Data- Evidence of the Shift

What We're Seeing in Our School

Grade Level	Students at Grade Level (BOY)	Students at Grade Level (MOY)	Net Growth
Kindergarten	13%	40%	27%
Grade 1	14%	37%	23%
Grade 2	24%	44%	20%
Grade 3	25%	47%	22%
Grade 4	40%	63%	23%
Grade 5	58%	72%	14%
TOTAL SCHOOL	30%	52%	22%

Key Metric	Beginning of Year (BOY)	Middle of Year (MOY)	The Impact
On-Grade Level Proficiency	30%	52%	+22% Growth: More than half of our school is now meeting or exceeding grade-level standards.
Students Needing Intensive Support	14%	5%	-9% Reduction: We have significantly decreased the number of students at risk for Tier 3.
Kindergarten Growth	13%	40%	Leading the Way: Our youngest learners showed the highest jump in proficiency (+27%).
Upper Grade Achievement	58% (Grade 5)	72% (Grade 5)	High Performance: Grade 5 remains our highest performing grade level, with nearly 3 in 4 students on track.

A Key Family Shift- What to do When Your Child Asks for Help

Instead of giving the answer.....

Try saying:

"Can you get a start?"

"Show me what you know so far."

"What have you tried?"

"Can you explain your thinking to me?"

Why this matters:

- ✓ It shows what your child understands
- ✓ It reveals what they still need
- ✓ It builds independence and confidence
- ✓ It keeps the focus on process, not product

What This Tells Us as Parents and Teachers

Understanding Comes Before Correctness

When a child shows their thinking...

$$1+2=3$$
$$3+5=$$



📌 We can celebrate partial understanding

📌 We can give targeted support

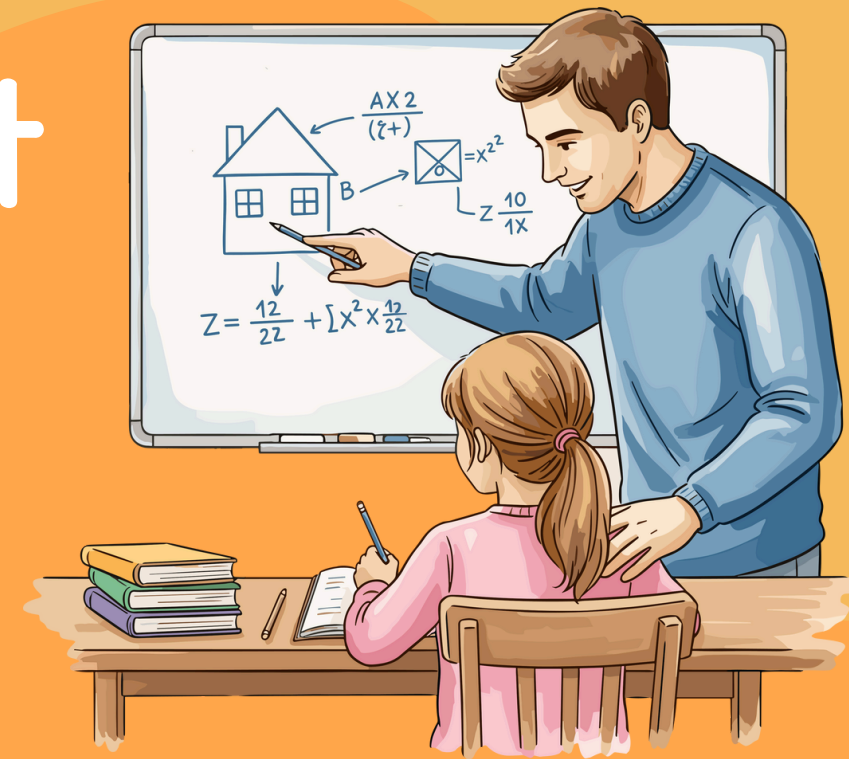
📌 We can guide– not rescue– the learning

Helping doesn't mean fixing, it means listening



This is a Family Mindset Shift

How We Talk About Math at Home Matters

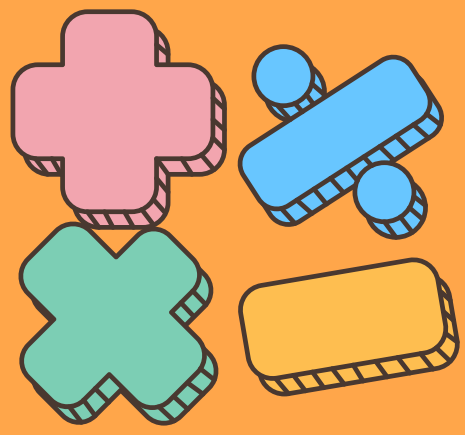


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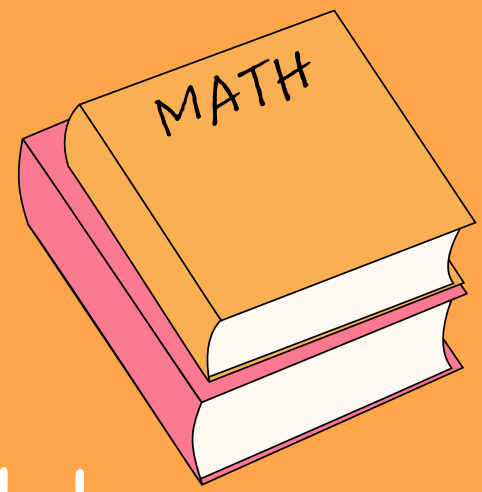
- “What did you get?”
- “Is that right?”
- “That’s not how I learned it.”

To...

- “How did you think about it?”
- “Tell me your strategy.”
- “That makes sense, what would you try next?”



What Parents DO NOT Need to Do

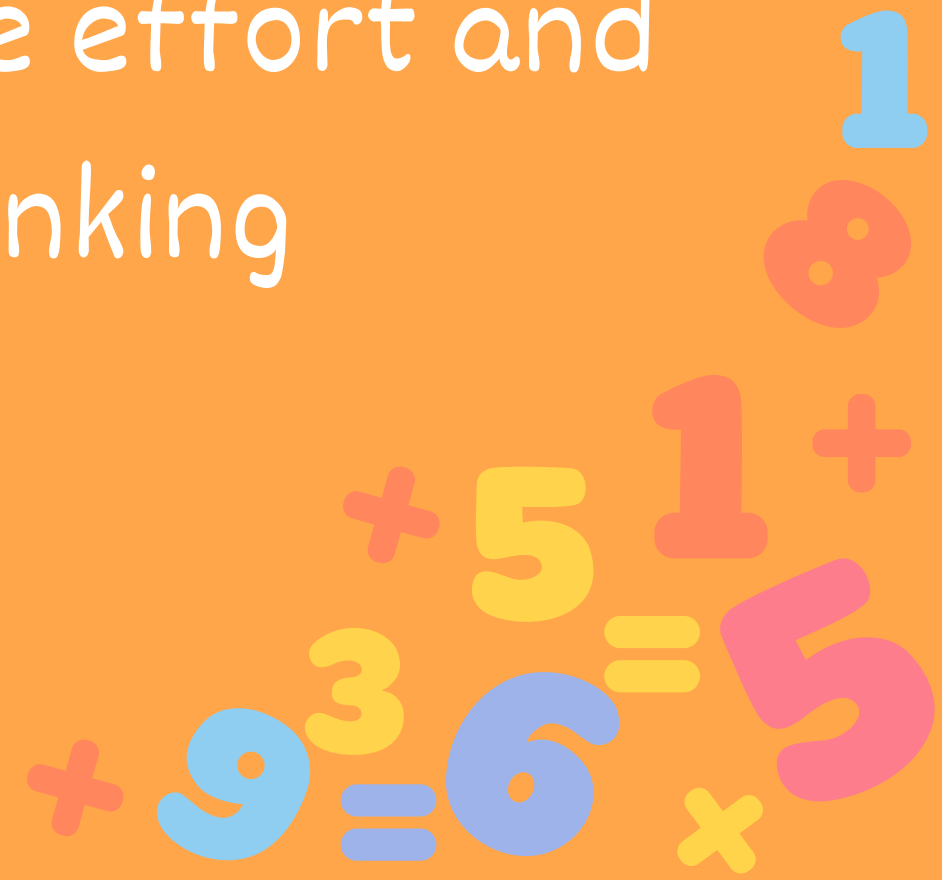


Parents do not need to:

- Know all the strategies
- Teach the lesson
- solve the problem first
- Fix mistakes


Parents should:

- Ask questions
- Encourage explanation
- Normalize struggle
- Celebrate effort and thinking



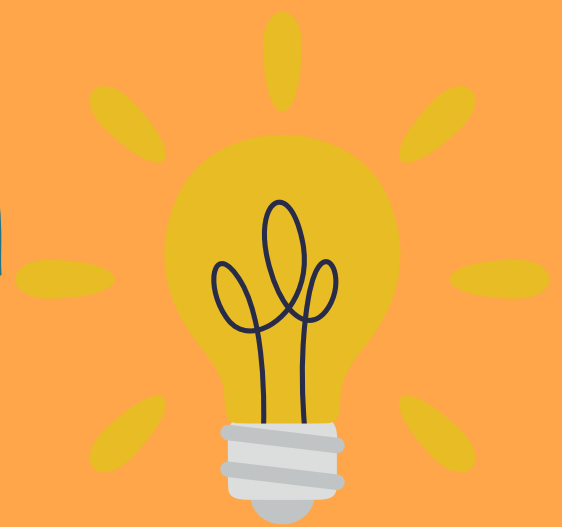
Bringing It All Together

Why This Approach Works

- 
- 📌 Builds deep understanding
 - 📌 Strengthens math language
 - 📌 Encourages perseverance
 - 📌 Prepares students for complex thinking in later grades

You are raising thinkers, not just answer-getters

Questions and Conversation



Share what feels different

Ask your questions about Supporting math
at home

Reflect on how this shift compares to
your own math experiences

One pager for supporting math learning at

