Discovery EDUCATION

From Telling to Thinking:

Disrupting Math Instruction That Doesn't Work

What happens when math classrooms are designed so students do the thinking, instead of following steps?

Add.

$$\frac{3}{8} + \frac{2}{8}$$

Add.

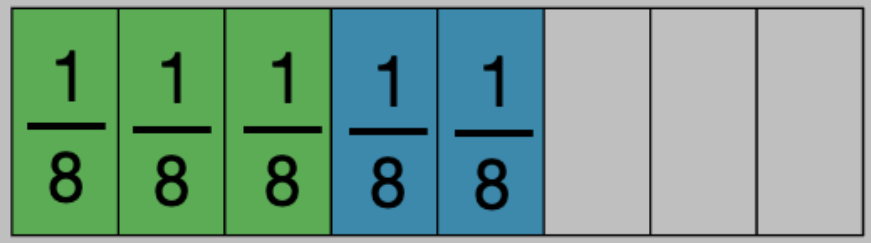
$$\frac{3}{8} \qquad \frac{2}{8}$$

Student 1:

$$\frac{3}{8} + \frac{2}{8} = \frac{5}{8}$$

Add the top, copy the bottom.
So, 3 + 2 = 5, keep the 8.

Student 2:

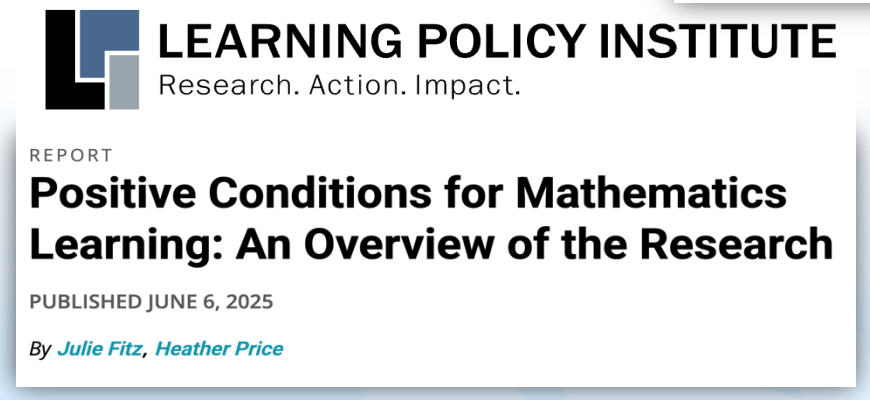


$$\frac{5}{8}$$

Both fractions are eighths. So, we have three eighths and two eighths. Together, that's five eighths.

Why Math Matters Right Now

- Math achievement shows slow nationwide recovery.
- Students who fell behind struggle to reengage.
- Strong math instruction supports long-term success.



Agree	**Strongly Agree**
Strongly Disagree	**Disagree**

Edtech should do the thinking for students when they get stuck.

“The goal of teaching is not to put a thought in a student’s mind. The goal of teaching is to empower a student's mind to generate thought.” *Dr. Tim Hudson*

WALK & THINK

Think of a skill you learned that you can STILL do today!

AUTHENTIC LEARNING EXPERIENCES

Purposeful Struggle

↓

Productive Struggle

↓

- ✓ **Deeper Understanding**
- ✓ **Grit**
- ✓ **Resilience**
- ✓ **Long Term Success**

Support when needed, independence when ready

AUTHENTIC LEARNING EXPERIENCES

What does authentic learning mean?

Real-world problems that matter to students, tied to their lives and curiosity.

What does it look like? Sound like?

Students wrestling with open questions, collaborating, and explaining their thinking.

Is it the same for all students?

No, tasks flex to meet each learner where they are.

Purposeful tasks lead to productive struggle, which leads to lasting learning.

PRODUCTIVE STRUGGLE

It's not just "making students work hard.

It consists of:

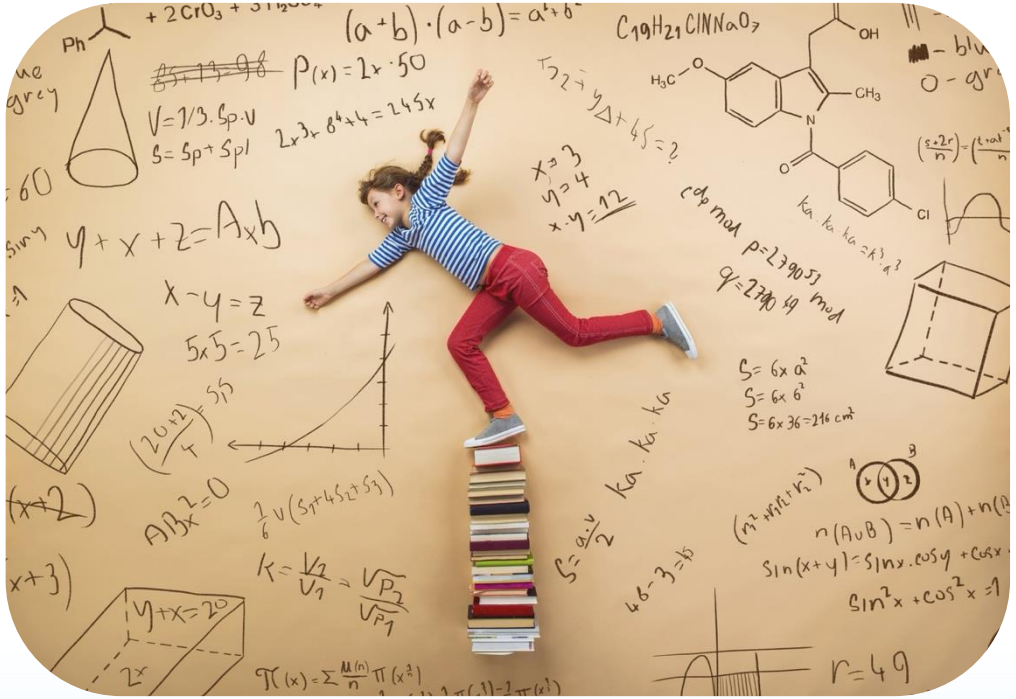
- ❖ Shape classroom culture intentionally
- ❖ Celebrate effort over right answers
- ❖ Select the right tasks
- ❖ Question instead of tell

Edutopia video – How Productive Struggle Fires Up Learners

Article from Science of Learning on youCubed – Supporting Teachers in Developing Productive Classrooms

LEARNING PROGRESSION

- Conceptual understanding
- Critical thinking & applying strategies
- Application & fluency



When learning something new, which stage do you spend the most time in?

LEARNING PROGRESSION

- Conceptual understanding
- Critical thinking & applying strategies
- Application & fluency

How do you know when a student has true conceptual understanding versus surface-level recall?

Productive struggle should be with the math, not the learning tool.

LEARNING PROGRESSION

- Conceptual understanding
- Critical thinking & applying strategies
- Application & fluency

How do you encourage students to compare and choose strategies rather than default to one?

Task selection is key when determining what will promote critical thinking and moving students to apply essential strategies.

LEARNING PROGRESSION

- Conceptual understanding
- Critical thinking & applying strategies
- Application & fluency

How do you help students transfer learning from one context to another?

Real fluency is not blind application of a strategy; it is thinking of the numbers and the situation to apply what makes mathematical sense.

What if students had a resource that:

- ✓ Encouraged productive struggle in a purposeful way
- ✓ Adapted to what each student understands
- ✓ Supported the learning progression from sense-making to strategy to fluency
- ✓ Offered tasks that required real thinking
- ✓ Helped students build confidence through effort and success
- ✓ Created consistent opportunities for long-term understanding

How would that impact students?

What would that mean for teachers?

Design Elements to Support Thinking

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Context

- Creates purpose and engagement through **meaningful situations**
- Fairness, challenge, and curiosity spark **student thinking**

Manipulatives

- Students act, explore, and discover **ideas for themselves**
- Scales **authentic "lightbulb" moments** every learner deserves

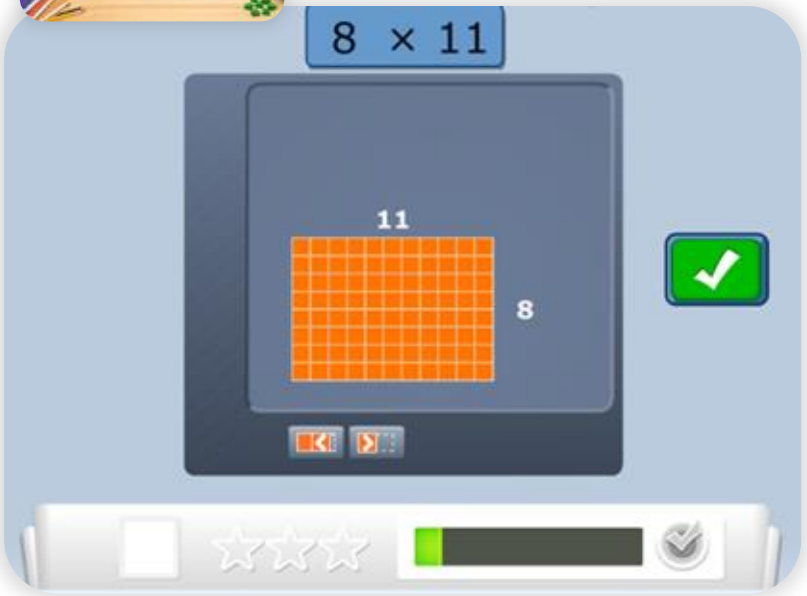
Hints

- **Just-in-time** clarity that preserves thinking
- Supports explicit instruction **without replacing reasoning**

Intentional Numbers

- Numbers shape strategy opportunities, adapt to the learner
- **Standards are the floor, not the ceiling**

Digital learning experiences should surface student thinking and strengthen the learning progression.



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Conceptual Understanding

- Sense making and exploration
- Open-ended investigation

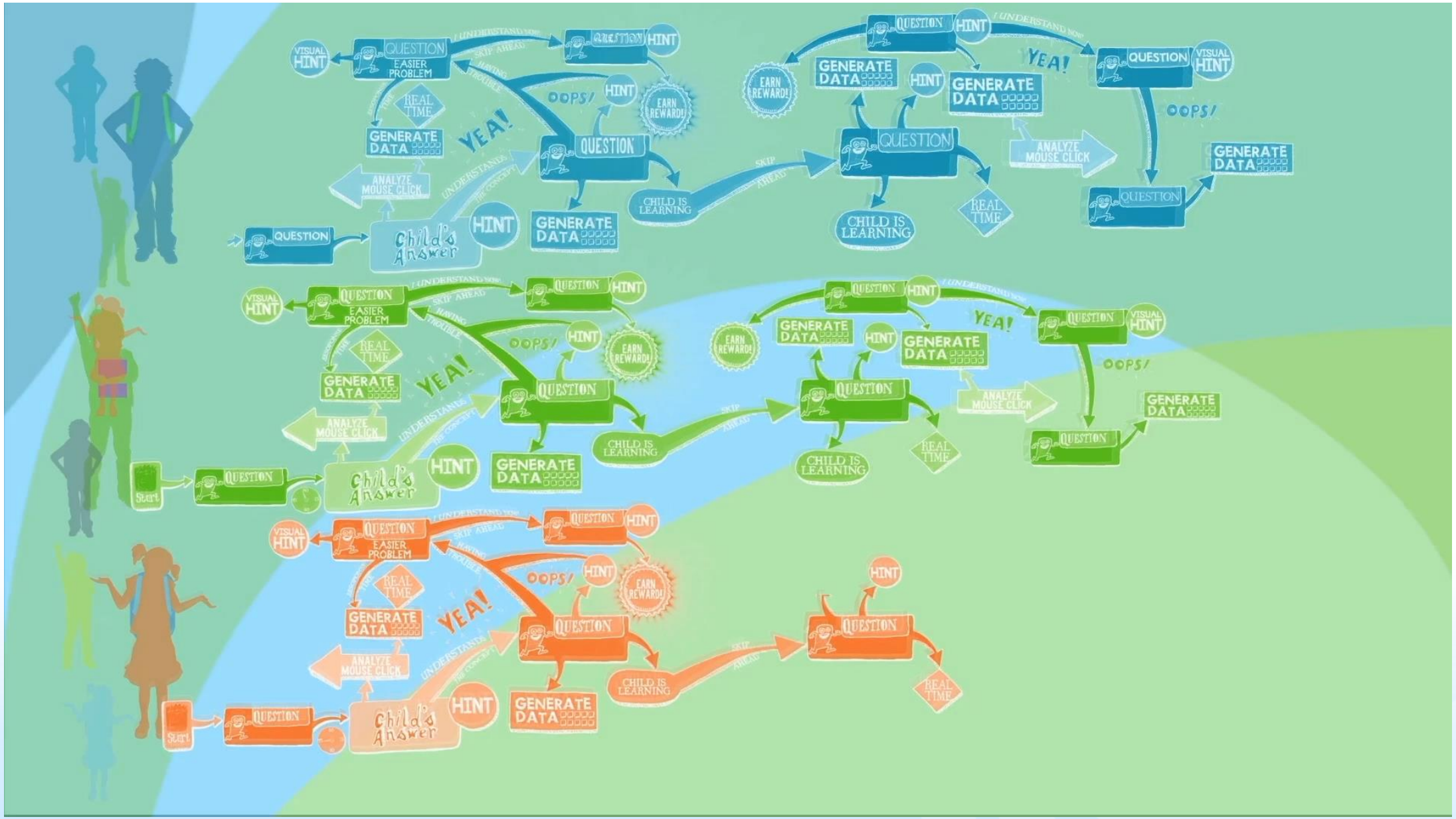
Finding Structure & Relationships

- Develop strategic thinking
- Apply multiple strategies

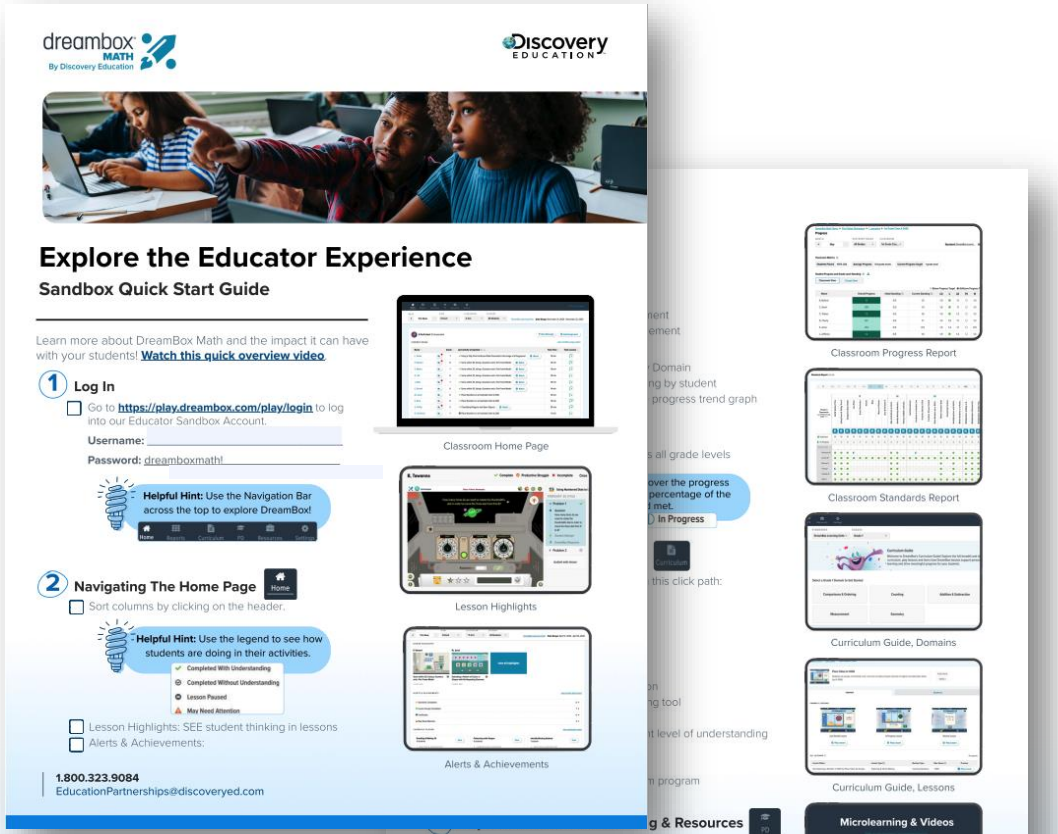
Procedural Skills & Fluency

- Apply strategies accurately, efficiently, & flexibly
- Mental math may be required

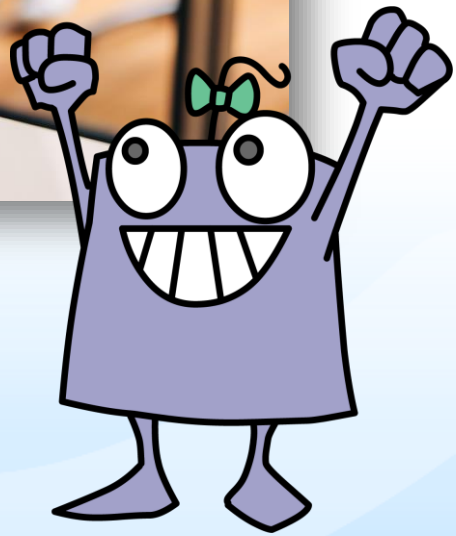
Intentional lesson design and progression


QUESTION
EASIER PROBLEM
VISUAL HINT
HINT
EARN REWARD!
REAL TIME
GENERATE DATA
ANALYZE MOUSE CLICK
Child's Answer
CHILD IS LEARNING
YEA!
OOPS!
Start

Explore DreamBox Math!!!



[Click here to Explore DreamBox Math]



POWERED by Thinking.

EMPOWERING Educators.

BUILT for IMPACT.

Your Summer Playbook for Tier 1 Instruction That Sticks

Join BryanGoodwin, CEO of McREL Institute, and Stephanie Workman-Bolden, SVP of Partner Success at Discovery Education, for a practical session designed to help districts turn summer planning into stronger instruction this fall.

Virtual Event
Wednesday, July 8
1:00 PM ET | 10:00 AM PT

SCAN THE QR CODE OR VISIT bit.ly/4vMeGFf

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Thank You