

Home Connections in Mathematics

Productive Struggle in Mathematics

We, as parents, want our children to succeed in school. We feel uncomfortable when our children struggle and often want to make the work easier to help them (and us) escape the discomfort.



While helping and making challenging material easier for our children may feel like the right thing to do, research shows us how being *less helpful* is more supportive of learning – permanent change in understanding. **Learning is greatest when children are given challenging tasks requiring thinking and reasoning. This active thinking is where sense-making, deep understanding, and self-confidence grows.**

Productive struggle in mathematics is the sweet spot we all experience when we have just enough support and prior knowledge to engage with a challenging problem. There is no learning without struggle. Doing the thinking for a child by explaining what must be done or providing a formula ensures there is zero thinking and, thus, no learning.

There are two important aspects to this idea:

- 1) *Productive*: children need support in the form of math tools (like coins or counters) and gentle guidance. E.g., “I wonder if a picture might help you understand this problem?”
- 2) *Struggle*: the task can’t be immediately obvious to the child

If a supported child struggles to the point of nearing frustration, it is appropriate to change the task to avoid unnecessary upset.

Messages our children need to hear:

- “I would love to help you with your homework. Before I do, I’m really interested in how you thought about this problem.”
- “Problem solving is *what we do* when we don’t know what to do!”
- “You worked really hard on that problem to find a solution. That is impressive.”
- “How does it feel to know that you wrestled with that tough problem and figured it out?”
- “I’m glad you made that mistake. Your brain grew at that moment. When you realized you had made a mistake, your brain grew even more!”
- “Doing mathematics is about being challenged. This is hard. This is fun!”

Links to Support You at Home



<https://www.youcubed.org/>

<https://www.mathplayground.com/thinkingblocks.html>

<https://solveme.edc.org/mobiles/>

<https://mathies.ca/>

So, let’s value and celebrate the struggle our children experience and forget the “*that was easy*” button.