



HOW TO BUILD RESILIENT PROBLEM SOLVERS



Are you frustrated with how easily some of your students just give up while doing a math problem? You know that if they just stick with it that they will learn but they just want to be hand-held through math class every day. In the book How Children Succeed: Grit, Curiosity and the hidden power of character Paul Tough argues that students succeed not because of intelligence but because of how much stick-to-it-ness, grit, and determination they have.

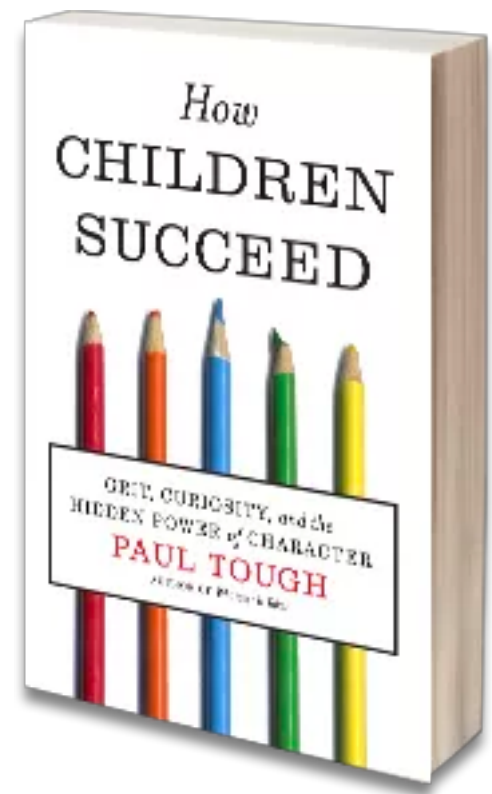
It's not that I'm so smart, it's just that I stay with problems longer. – Albert Einstein.

Tough says that you can build perseverance in children by playing chess. From his book he states, *"Teaching chess is really about teaching the habits that go along with thinking," Spiegel explained to me one morning when I visited her classroom. "Like how to understand your mistakes and how to be more aware of your thought processes."*

Playing chess over and over builds up a chess player's level of determination. They have to take risks and learn from those risks in order to succeed. If we want our math students to build up resilience and determination then we also have to push them take risks and learn from the outcome of those risks.

In math class we can build up resilience, grit and stick-to-it-ness if we put students in experiences where they have to persevere through a tough situation. But think of their whole math class experience up to this point. It's likely that a student would never have had the opportunity to try to solve a problem before we math teachers show them the examples and how to solve it the math teacher way. Our students need experience persevering through tough situations like the chess player.

Imagine the first time you play chess and your opponent takes your bishop early in the game. You might think the game is pretty much over. Why go on? Or think of the young basketball player who has the right footing for a layup. They definitely weren't a pro at that the first few times. But over time in each situation players overcome that resistance and persevere. They learn to be successful.



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But in math class we assume math students should be good problem solvers and have grit in our math classes immediately. We say “our students give up too quickly” but when did we ever give them time to build those perseverance skills up? When did we teach them how to persevere? We are the ones that have to give them experiences to build that skill up.

3 TIPS TO PREVENT “GIVE UP MOMENTS” AND CREATE RESILIENT STUDENTS

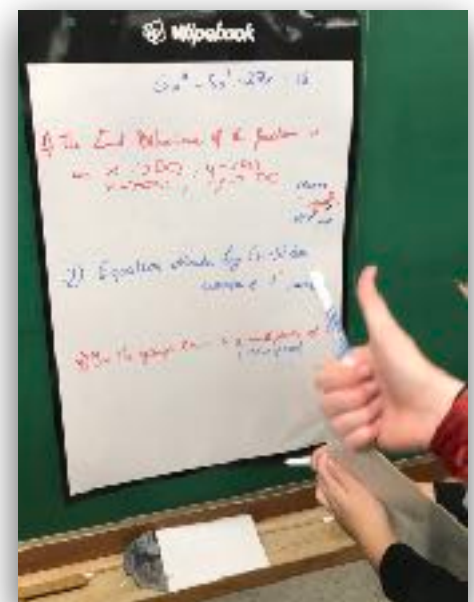
1. Routinely have students solve unfamiliar problems through a supportive productive struggle process.

Use the **Hero's Journey to structure your math class** and create productive struggle moments daily for your students. As an example, if I didn't push my students to solve **these problems** routinely on their own to start our lesson then they would not only miss gaining the experience to persevere but I the teacher would also miss gaining valuable information about what my students know or don't know. Problem solving must be a regular part of learning not just a once a unit or end of unit thing.



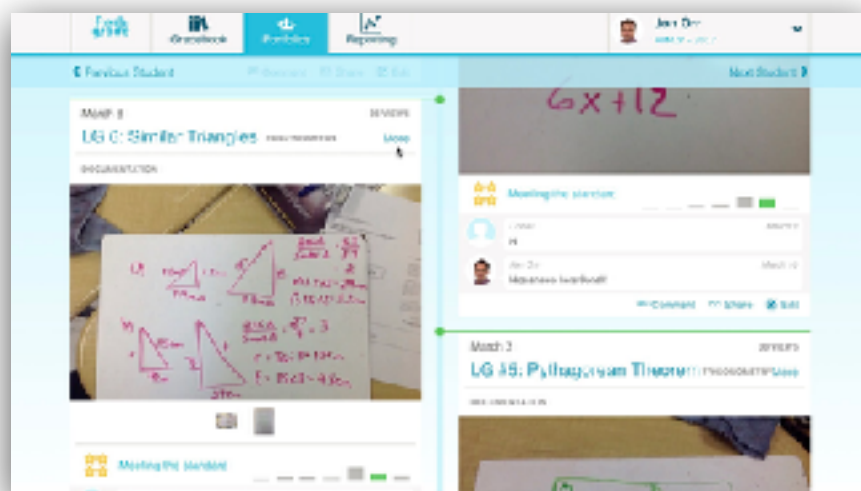
2. Create an environment where risk taking is low stakes.

In order for students to take risks and learn how to persevere the stakes for failure have to be low. It has to be painless to make mistakes. How are we doing this in our math classes? One easy-to-implement technique to make risk-taking low stakes is to bring dry-erase boards into your classroom. The non-permanence of the boards makes risk taking easy and it's one of **my favourite things**. Students can attempt strategies quickly and wipe away quickly if needed. You can read more about the research behind non-permanent surfaces from [Peter Liljedahl](#).



3. Show students that you value perseverance.

Create an assessment routine that promotes growth instead grades. Students quickly learn what you value. If we're saying to them daily that we value the process of their learning over the final answer than how to we prove it to them? Your actions speak loudly. Give your students room to show that they have persevered while solving problems. Learn how you can implement an assessment routine that promotes growth and resilience by watching Conall's Assessment story:



Disclaimer: This transformation won't happen over night. You yourself have to be resilient and determined. It's possible that you might not see that change even this semester. But by allowing students to productively struggle through problems, giving them a low stakes risk taking environment and proving to them you value persistence WILL build their resilience and determination in the long term. We also must have a stick-to-it-ness to build great thinkers!