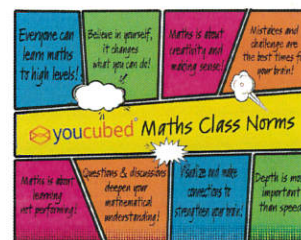


Depth is more important than speed!



Many people incorrectly believe that being good at maths means being fast at maths. Yet many famous and award winning mathematicians talk openly about being very slow with maths, pointing out that what is important is seeing connections and thinking deeply. It is important that maths classrooms dissociate maths from speed, to unlock the potential of many amazing and slow thinkers. When we value fast computation we encourage a subset of learners who compute quickly and discourage many others, including deep slow thinkers who are very important to maths.

We do not need students to compute quickly (we have computers and phones for this) we need them to think deeply, connect methods, reason, and justify. We also know that we do not help students become faster in examinations they have to take at the end of a year or the end of school by giving them timed tests to practice on. Timed math fact tests are the early onset of maths anxiety for many students and when we give tests like these the faster students stay fast and the slow students stay slow or get even slower, as maths anxiety sets in.

Our popular paper Fluency without Fear: <https://www.youcubed.org/evidence/fluency-without-fear/> not only describes the ways anxiety from speed impacts the brain, impeding its ability to function, but also shares ways to teach maths facts through activities students will enjoy and that lead to deep understanding. Other suggestions are:

1. Tell students you don't value fast work, instead you value creative representations of ideas. Mathematical thinking is about depth not speed.
2. Don't let mathematical discussions be driven by the fastest students.
3. When asking for hands up, don't always take answers from the first students who raise their hand, that gives all students the message that what you value is speed.
4. Don't use flash cards, speed competitions, timed tests, instead value depth, creativity, different ways of thinking about maths,



"I was always deeply uncertain about my own intellectual capacity; I thought I was unintelligent and it is true that I was, and still am, rather slow. I need time to seize things because I always need to understand them fully. Towards the end of the eleventh grade, I secretly thought of myself as stupid. I worried about this for a long time.

I'm still just as slow. (...) At the end of the eleventh grade, I took the measure of the situation, and came to the conclusion that rapidity doesn't have a precise relation to intelligence. What is important is to deeply understand things and their relations to each other. This is where intelligence lies. The fact of being quick or slow isn't really relevant."

- Laurent Schwartz,
Winner of the Fields Medal
(A Mathematician Grappling with His Century, 2001)