Erase Secondary "Math Dread" with 7 Powerful Tools for Lasting, Massive Motivation

Motivation…we've all been there before - or at least I hope I'm not the only one. I'm talking about those moments when teaching math to your middle or high school students feels more like pulling teeth. You push, pull, twist, bend, do a cartwheel, whatever – and they still don't budge.

But you are not a dentist, and you sure aren't paid like one. Whether it is trying to get them to do an assignment, participate in an activity, or contribute to a class discussion, some days it feels like you are doing all the pulling.

The Brain's Natural Motivators

Instead of pushing, pulling, twisting and cartwheeling to get students to do things in your math class, you'll find tremendous success (and relief) by simply tapping into the brain's natural motivation systems. If you've heard me speak at a conference or to your staff, you already know the brain's three hardwired motivators that universally drive motivation. Tapping into these in every lesson is a game-changer for math teachers. If you aren't aware of the brain's hardwired motivators, email me now so we can find a way to get you up to speed. All math teachers need to know them, and how to use them.

This special report is an addition to those BIG 3 motivators. While those 3 motivators stay constant throughout life, we have other motivational drivers that shift as we age. What motivates a 5-year-old will likely not get the job done with a 15-year-old.

What you'll find below are additional motivators that are effective specifically amongst secondary students. The adolescent years are a phase of brain development that comes with unique motivational drivers.

I'm going to assume you already know some of the more widely known strategies to motivate students. You already know that students are motivated by choice. Their perception of **autonomy** is, indeed, a strong motivator (Lazowski & Hulleman, 2016; Cheon & Reeve, 2015). But just because you let them choose whether they solve a system of equations through substitution or elimination doesn't guarantee they are actually going to solve them, does it?

You likely know that students are also motivated by **success** (Ryan & Deci, 2013). When students KNOW they have actually learned something, or done something right, the natural reward system of the brain releases dopamine. You might have heard of dopamine in discussions around addiction. That's because dopamine drives someone to come back for more. If it is a drug, they want more. If it is a feeling of successfully completing a long division problem, they want more. But what do you do if you are trying to motivate them to try their first matrix multiplication, or something else new that they haven't experienced success with … yet?

Autonomy and success are powerful motivation tools that can peak student's interest, get them started on a task, and keep them coming back for more dopamine. When these tools work, you experience the magic and joy of learning. You feel energized and connected to your purpose of being a teacher.

When your efforts to motivate students fall short do you feel defeated, exhausted, and perhaps even frustrated with your students and yourself? Have you ever experienced how your student's level of motivation impacts your own motivation? To keep everyone's motivation levels WAY UP, check out these 7 tools to transform your math instruction from mundane to motivating:

1. **Boost Your Connections with Top 3 Leaders in Class**

   WHY THIS WORKS: Let's be honest - It can be tough to like a student who often appears unmotivated. But the stronger your relationship with them, the more "connected" they feel to you. That connection helps them want to please you by working harder.

   Plus, when the class leaders are working hard, the science of "brain syncing" reminds us that their peers will often follow (Bevilacqua et al., 2019; Dikker et al, 2017). The leaders of the "pack" have a huge social influence over the rest of the group (Brechwald & Prinstein, 2011).

HOW THIS WORKS: Begin by having one-on-one conversations with students about topics NOT related to school. Does he regularly have his earbuds in? Ask about what he is listening to. Overheard her talking about her plans for the weekend? Make a note to ask her about it on Monday. Keep your focus ONLY on building the relationship. The motivation will naturally follow. Students consistently show higher levels of motivation when they believe their teacher cares about them personally (Urhahne, 2015).

2. **Friendly Competition**

WHY THIS WORKS: A friendly competition works for a few reasons. First, at your student's age, social status is currency. Teens (and tweens) like to look good to their peers. The greater their success in the competition, the better the "bragging rights" (for weeks) and positive feelings of peer status. Status is a huge driver for teen behavior (Wentzel, 2017).

As mentioned above, students are also motivated by **success** (Ryan & Deci, 2013). This is one reason people like to win. That rush of dopamine feels good. A healthy level of competition releases testosterone and cortisol in the brain in doses that boost motivation (Casto & Edwards, 2016). If the competition is too intense or the stakes are too high, cortisol levels could create stress levels too high for learning … so keep the competition friendly.

HOW THIS WORKS: You can use both of these to their learning advantage by creating some friendly competitions between classes. Having one student competing against another individual can be too risky and some students might "forfeit" before giving any effort. Class-wide or team-to-team competitions keep the individual stakes low. Invite one of your colleagues (or another one of your classes) to join the competition for longest streak without a tardy or # of days with all assignments complete, etc. Keep it friendly where the winner gets to receive an act of kindness from the other class or another privilege.

3. **Make it Too EASY; Begin with a "Side" Step**

WHY THIS WORKS: Some students are unreceptive to your traditional motivational tools because they lack the efficacy to believe they can succeed. They either don't believe in themselves, or they don't believe in their ability level. What it sounds like is the all-to-common, "I'm just not a math person." A more likely explanation is the student has become discouraged by the enormity of the learning task, and possibly experiencing excessive cognitive load – essentially an overwhelmed working memory (Paas & Ayres, 2014). To support these students (without lower your expectations or learning goals), start with something smaller to build confidence, and continue from there (Cowan, 2013).

HOW THIS WORKS: A "side step" is a strategy that gets students to do the task

from a similar problem or task. To reach those students, break down the task into its most simplistic steps that are a guarantee success for all. You might get a "deer in the headlight" look from your students if you pose a question like this to your them: "Today is the lucky day you get to buy a Tesla. Your options are:

a) Put 20% down, and then pay monthly payments for 60 months with an interest rate 4.5%
b) Put 15% down, and then pay monthly payments for 48 months with an interest rate of 5.3%

If the price tag on your dreamy Tesla is $120,000.00 which option gives you a lower monthly payment? Which option has you paying less money overall?

Instead of overwhelming your students with this complex problem, start with a "side step" problem that has been simplified to calculating 20% down on a $100 price tag (with a partner), and then take the next small step of calculating interest rates, etc. See how little these steps are? Before you know it, they'll be designing a masterpiece display of effort and motivation.

4. Make it Almost IMPOSSIBLE; Begin with a Micro Step (Challenge/Mastery)

WHY THIS WORKS: For some students an approach on the other end of the spectrum will motivate them to action. With some researchers citing students already know 50% of what is being taught, it's no wonder many students have low levels of energy and motivation (Nuthall, 2005). Students need more challenge, and a challenge-seeking mindset is a hallmark of highly successful learners (Hochanadel & Finamore, 2015). When raising the challenge bar, ensure students have access to resources for support (people or tools), and the challenge taps into a student "driver".

When creating more challenge, remember to set mastery goals with students because they focus on mastering a new skill, attempting to accomplish something challenging, and seeking to understand new learning material. Students find mastery goals motivating because of the challenge and interest inherent in the task (Meece, Anderman, & Anderman, 2006). (Note: Mastery goals are not the same as performance goals that rely on social comparison. Performance goal: Am I doing better than David? Mastery goal: Am I doing better than I was last quarter?)

HOW THIS WORKS: Do you have students who might be motivated by hearing you say, "No one has ever been able to solve all these math puzzles alone. But with my help … YOU WILL SUCCEED!"? Or maybe this would work: "Most students don't learn this until 8th grade, but I think you guys have what it takes to master it now. Now, maybe we can start with just this step first…"

I've always enjoyed watching my students jump at the challenge of designing and constructing a scale model of something that includes ALL 8 of the 3-D geometrical shapes we have studied. We start with one shape at a time, and work to build mastery as the design their masterpiece. The possibilities for calculating, problem-

solving, and mastery goals are endless.

5. **Make it Social**

WHY THIS WORKS: Research supports the idea that students are more motivated when they can interact and feel connected to their peers (Ryan & Deci, 2013). When students feel socially connected to the students in their class, it creates a culture of safety where students are willing to take learning risks (ask a classmate for help, admit they are struggling, etc.). Students who feel socially connected to their classmates are also more intrinsically motivated, have higher levels of cognitive attention (because they aren't consumed with worry about whether their peers like them/will tease them), and ultimately demonstrate higher levels of achievement (Mikami et al., 2017).

HOW THIS WORKS: Create time for students to get to know each other and foster friendships for a couple minutes before jumping into a project together. Keep the learning activities social with partner reviews, group projects, team teaching, group competitions, etc. More importantly, let the social groups set up their own group goals and group steps to take. Continually ask yourself, "Is this something students *really* need to do alone, or can they work with a classmate on this?"

If you're concerned about the social aspect leading to off-task behavior, here are a few tips:

- Add urgency to the task: "*You only have ___ minutes to complete this together"* OR "*Be sure you get to step ___ before the timer goes off."*
- Increase the stakes for success: "*Groups that successfully complete this challenge will earn ____.*" OR "*Since there are two of you working together, this counts for double the points!*"

6. **Make it Risky**

WHY THIS WORKS: The adolescent years are a time of self-exploration and risky decision making (Reyna & Farley, 2006). Most of their risky decision making can be explained by the delayed maturation that happens in the pre-frontal cortex – an area of the brain known to manage critical thinking, responsible decision making, and anticipating consequences of choices. This part of the brain is not fully developed in teens AND can be impaired even further by the high emotions that dominate the life of a teen. Their impulsive, emotion-driven brains don't always lead to the best decisions, as you might recall from your own youth. Here is how you can use their drive for risk to your advantage:

HOW THIS WORKS: Capitalize on their craving for high-risk activities with phrases like this: "I'm not exactly sure if this is safe, or even school approved, … but we are going to try it anyway." Or, "Please don't try this at home." "This could totally backfire on us, but let's start small..." Or even, "I'm not sure if we should try this. I think the

last teacher that tried this, got fired." Then, your students might say, "Okay, okay we WANT to do that."

7. **Connect to a Greater Purpose**

   WHY THIS WORKS: People first begin to explore their sense of purpose in the world during their adolescent years. It is a time of exploration and beginning to notice the world outside of themselves. When students are engaged in a task that is both meaningful to themselves and contributes to the world, their sense of purpose becomes the driving force behind their motivation (Damon, Menon, & Cotton Bronk, 2003).

   HOW THIS WORKS: Listen to your students to decipher what social issues are important to them. It might be an environmental issue, homelessness, youth depression, or any other social issue. Then design the lesson/activity around solving that issue. Have them graph the current statistics on teen depression, with a conversation on where they can go for help. Put their math skills to work to calculate all the lengths, angles, and cost of supplies to build a mini shelter for the homeless. Want to really see teens at their best? Organize a time after school for them to actually build one to donate to the community. One of my former math students (now a math teacher herself) did just that. You can listen to her students talk about how meaningful that project was to them here.

Not every motivation strategy works for every student ALL the time. The more tools you have at your disposal, the greater your chances you'll meet your goal. Pay attention to what works for each student so you can replicate that strategy again. If a particular strategy doesn't work, don't give up. Keep trying until you find the tool that works. Remember, *your* motivation level impacts *your student's* motivation. Stay positive, and be persistent in your worthwhile goal of motivating all your secondary math students.

WHAT NOW? No one wins when students are bored or discouraged. It is bad for student learning, and just as bad for teacher morale. If you are struggling to boost your secondary math teacher's motivation skills, give them the support *THEY NEED*. High engagement, high energy, with evidence-based tools for secondary math teachers is my professional development expertise. I'd love to help. Contact me at:
< Liesl.mcconchie@gmail.com>

Citations

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