

Mind Over Matter: Growth Mindset in the Postsecondary Classroom
NCTM Annual Conference - Friday, April 27 11:30am-12:00pm

Intervention 1: Neuroplasticity

	Math Courses (In class)	Support Services (Out of class)
WHEN	➤ 2nd week of class	➤ New Tutor orientation ➤ Level II Tutor training
HOW	➤ Short video on how our brains can grow by forming new pathways ➤ Partner discussion questions ➤ Whole class discussion	➤ Short videos ➤ Group/partner discussion
WHAT	➤ Brain is a muscle ➤ Intelligence grows ➤ There is no “math gene” or a “math person”	➤ Anyone can learn anything ➤ Learning quickly is not “intelligence” ➤ You are not a “math person” a “science person” or a “language person”

Intervention 2: Productive Struggle

	Math Courses (In class)	Support Services (Out of class)
WHEN	➤ 4th or 5th week of class ➤ Key educational timing - following the first exam	➤ Pre-semester meeting ➤ New Tutor orientation ➤ Level II Tutor training
HOW	➤ Short video on productive struggle ➤ Partner discussion questions ➤ Whole class discussion	➤ Discussion (meeting, orientation) ➤ Tutor videos (orientation) ➤ Short videos (Level II)
WHAT	➤ Defining <i>error detectors</i> and <i>synapses</i> in brain ➤ Learn more from making mistakes	➤ Praising outcomes deflates motivation ➤ Struggle can mean something positive or negative ➤ Struggle can be messy

Intervention 3: Using Mistakes

	Math Courses (In class)	Support Services (Out of class)
WHEN	➤ Ongoing through the semester	➤ Pre-semester meeting ➤ Observation discussions ➤ Level II Tutor training
HOW	➤ Mistake problems in textbook ➤ Discussing “favorite” student mistakes on exams	➤ Group processing (meeting) ➤ 1-1 discussion (observation) ➤ Video (Level II training)
WHAT	➤ Students analyze math problems that are incorrectly done ➤ Students determine the conceptual error made	➤ Finding mistakes helps students analyze ideas within the problem ➤ We want to mirror what some classes do to change math content

Intervention 4: Math Talk

	Math Courses (In class)	Support Services (Out of class)
WHEN	➤ Ongoing through the semester	➤ Ongoing through the semester
HOW	➤ Incorporated into formative assessments and instructional time	➤ Foundational to active learning in tutoring sessions
WHAT	➤ Discuss several different ways to do a problem ➤ Design activities or tasks that require students to talk about mathematics ➤ Alternate approaches to problem solving ➤ Present partners’ work to class	➤ Why, how, what if, tell me, show me prompts ➤ Talking through notes to investigate problem solving and concepts ➤ Getting students to solve problems in groups or pairs

Assessment

	Math Courses (In class)	Support Services (Out of class)
WHEN	➤ Pre-Survey - 2nd week of class ➤ Post-Survey - 13th week of class	➤ Beginning, middle, end of semester
HOW	➤ Science Motivation Questionnaire II (Glynn, S. M., Brickman, P., Armstrong, N., & Taasobshirazi, G., 2011)	➤ Observation Guidelines ➤ Review video before discussion ➤ Discuss with observer
WHAT	➤ 5 components, including self-efficacy and motivation ➤ Change from fixed to growth	➤ Encourage effort ➤ Find a mistake ➤ Open tasks