

# STEM CENTER Teaching Enhancement Grant Proposal

**Title:** Foundations of Mathematics – Hands-On Practice with Educational Manipulatives

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**Budget:** Approximately \$1500.00

**STEM Courses:** MATH 1384, Introduction to Foundations of Mathematics I(Spring 2021)

1384-01 32 students

1384-02 16 students

1384-03 32 students

1384-04 16 students

1384-05 16 students

1384-06 16 students

Total Sections: 6

Total Students: 128

## Executive Summary:

In the Mathematics Education introductory courses at SHSU, our students are expected to be engaged in hands-on teaching techniques and practices to increase absorption of pedagogic suppositions. The curriculum includes but is not limited to: study sets, systems of numeration, natural numbers, integers, number theory and rational numbers. Our two foundation of mathematics courses (1384 and 1385) are rich in manipulative exploration as well as in learner friendly teaching environments. Every semester our students are taught more than nine concepts involving hands-on manipulatives. Unfortunately, due to COVID restrictions both Fall and Spring semester, using hands-on manipulatives have been problematic owing to potential contamination. Learner engagement has been less than ideal and as an instructor, I would like to critically evaluate other options to maintain the level of involvement that SHSU would like to see with our students. In order to improve our introductory courses in mathematics education and rebuild our learning communities, my proposals asks the STEM CENTER for a Teaching Enhancement Grant that would allow students to have a personal set of manipulatives for their use during these courses. These manipulative packets would consist of sets of three of the most popular manipulatives utilized in these courses: double sided color counters, Cuisenaire rods and pattern blocks. As educators we know that learners retain knowledge more effectively when they are engaged and involved in hands-on learning. Furthermore, our students would be able to have these manipulatives with them when they are not in the classroom supporting the pedagogy that learners should be reinforcing their lessons outside of the classroom. Having their own personal set of manipulatives both incorporates active learning outside of the classroom and provides our students with engaging assignments within the classroom whether it be virtual or face to face.

## Project Narrative:

Currently, in our curriculum for Introduction to Foundations of Mathematics I (1384) we have the following pedagogical practices and their respective manipulatives: integer representation – color counters, part and whole sets – color counters, Cuisenaire rods and pattern blocks, part/whole continuous unit – Cuisenaire rods, addition and subtraction of integers – color counters, addition and subtraction of fractions – Cuisenaire

rods and pattern blocks, and multiplication of fractions – color counters and pattern blocks. This list is certainly not complete and highlights our more popular uses of the items. Our curriculum is brimming with practices that are most effective with the use of hand-on manipulatives. Each concept listed above has several objectives, lessons, guided exercises, independent practices and evaluations that use the manipulatives.

Our students are prospective teachers and therefore, it is imperative that we prepare our students in the manner by which we expect them to teach in the near future. The NCTM (National Council for Teachers of Mathematics) believes that as teachers we should provide communication, connections and representations within our classrooms. As a preceptor to those prospective teachers I would like to lead by example and provide my students with the most opportunities possible for them to engage and practice active learning styles. Our foundations of mathematics courses should provide our students with the richest form of hands-on opportunities so that they will deduce the significance of teaching with manipulatives in their classrooms upon graduation and their careers as teachers.

**Budget:**

<b>Quantity</b>	<b>Item</b>	<b>Price per unit</b>	<b>Total price</b>
3	Cuisenaire Rods – plastic (50 tray sets)	\$299.95	\$899.85
2	Double-sided Counter Counters (2000 count)	\$47.95	\$95.90
5	Pattern Blocks (2000 count bucket)	\$76.95	\$384.75
1	Ziploc Gallon Bags (250 count)	\$35.69	\$35.69
		<b>Total</b>	\$1416.19

**Budget Justification:**

This budget reflects the amount of manipulatives necessary to create individual packets for each student enrolled in 1384 for the Spring Semester. Items will need to be packaged into Ziploc baggies in order to be distributed to the students. It would be ideal to have the materials before the beginning of the semester to allow time for the instructors to create the packages.