**Justin Osterstrom: Kenan Fellow Class of 2011**

**“Building Problem Solving Skills through Engineering”**

*Work Overview*

The lessons I created for my Kenan project are all based on developing and deepening problem solving skills in grades Kindergarten through Fifth grade. I am a STEM/21st Century Skills specialist at Combs elementary, which provides me an opportunity to design work that can be used with multiple classes K-5. Even though I am a specialist, any of these lessons could be done within the regular classroom. I have previous classroom experience in 4th and 5th grade, and have seen first hand the value of expanding science instruction currently being taught.

The overall idea of my project is to provide a lesson that could bring an engineering focus while meeting multiple standards within each grade levels standards. Teachers often misunderstand how engineering can be used and miss the value it brings into instruction. I build my lessons using the 21st Century Skills framework and apply the principles of Dr. Bill Daggott’s work done with Rigor and Relevance in each of my units.

My lessons are foundationally STEM (Science, Technology, Engineering, Math) instruction. They have elements of each part throughout the unit development. Each lesson covers about a week of instruction. Teachers can manipulate these times, but value must be placed in giving time for students to dig deeper into the content. Each lesson has a STEM notebook pages (similar to science notebooks already being done) attached to be used; some also have extras depending on the lesson. Each of these lessons could easily be modified to be used in any grade level K-5.

A lot of my work done with Kenan has been implementing the use of the EiE (Engineering is Elementary) curriculums developed by the Boston Museum of Science. I have participated in 5 national field testing over the past 2 years. My experience using these kits and others they have previously published that are connected with Grades 2-5 science kits, have shown me how well engineering reinforces and expands the students learning of science topics covered.

The common problem with developing engineering lessons is that a teacher/facilitator truly cannot predict where the students thinking with lead their instruction. Caution must be used on looking at each lesson as a “tightly-closed box answer”. Students, depending on their schema and backgrounds, might take the learning in multiple directions. Modifications, alternative assessments are tough with these types of lessons. They are built using a team mentality, which in my mind, serves most modifications needed to be addressed within a full-inclusion classroom.