Project Description

Project Background:
The WE @ RIT organization maintains and conducts the TEAK program, known as Traveling Engineering Activity Kits. The TEAK program is focused on teaching students in the surrounding Rochester community about engineering concepts and their relationship and impact on the world around them. The long term goal of this project is to develop four TEAK kits focused on the area of sound and music. These kits will teach students how music is produced, both mechanically and electronically, and how the ear perceives that as sound. The kits will relate to engineering through the incorporation of the design process and teamwork into each activity.

Problem Statement:
The TEAK project involves the design and fabrication of innovative and interactive kits to teach sound and music concepts to students grades K-12 in the Rochester community. These kits must be safe, portable, and comply with all NY State Math, Science, and Technology Learning Standards.

Objectives/Scope:
1. Development of four engineering activity kits that will allow students to utilize creative learning tools to learn and discuss engineering topics related to sound and music.
2. Development of detailed documents for each individual TEAK Kit. These documents will offer teachers and future TEAK co-ops the ability to instruct and teach their students the concepts of each TEAK kit without an engineer present.
4. The TEAK kits must be safe, portable, and durable.

Deliverables:
- A detailed design for all activities and hardware to build, including proposed test plans.
- A complete lesson plan that outlines planned learning objectives, NY State Math, Science, and Technology Learning Standards, teaching concepts and questions, and activity breakdowns.
- Other documents to support the lesson plan, including activity handouts, a visit checklist, take home brochures, and a kit summary.
- At least one classroom visit to gain feedback and troubleshoot the kits.
- A minimum of four TEAK kits related to sound and music.

Expected Project Benefits:
- Kits will serve as an interesting, interactive learning tool for students K-12 in the Rochester community.
- The development of sound and music kits will allow the team members to become more familiar with sound and music concepts.
- The design and fabrication of additional TEAK kits will allow RIT to build and sustain a solid foundational relationship with the Rochester community.

Core Team Members:
- Sheryl Gillow – Mechanical Engineering
- Heather Godlewski – Mechanical Engineering
- Bryan Lozano – Electrical Engineering
- Jeremy Schuh – Electrical Engineering

Strategy & Approach

Assumptions & Constraints:
The team must first come up with lessons plans which satisfy the NY State Learning Standards for math, science, and technology. The kits and activities have to be simple enough to teach a variety of sound and music concepts to 6th grade students. The TEAK kits developed must be highly interactive and engage students in basic concepts, while expanding those concepts into the world of bioengineering. The proposed budget is $3,000.

Issues & Risks:
- Project Understanding
  - Sound is a new area of study for some of the team members.
  - Extensive research on sound and music concepts.
  - Lesson plans should be in accordance to the NY State Learning Standards.
- Financial
  - Completing the project within the budget.
  - Creating kits that don’t require significant funds to fix or maintain.
- Available Resources
  - Ordered part lead times.