1. **Big Ideas -**

**Theme: Energy - Content and Communication**

- We would like to lead our students to understand the importance of energy and its impact on our everyday life, including our economy. As part of this content, students will build a knowledge base of different energy forms and how they work to gain technological literacy and basic understanding.

- To gain and build support for this big idea, we need to communicate to our colleagues the importance of STEM literacy, and the connections already present between our content areas. We plan to develop materials to share with colleagues to support this initiative.

- The materials will share a common vocabulary to reinforce cross-curriculum connections for both teachers and students. A bank of problems will be created using the vocabulary, incorporating math skills in an energy context and shared with colleagues. The collection of problems and activities will be expanded as more input is gathered from other instructors of applied mathematics and sciences.

2. **Goals and Objectives -**

a. Students will experience the engineering design process through the development of products such as cars, catapults or similar working objects using a various forms of energy.

b. Instructors will be encouraged to use this model in their classrooms. To facilitate, the STEM team will provide ready-made problem sets and activity lesson plans.

3. **Timeline -**

**During the current school year:**

a. 1st 9 weeks goal:
   Stem team will develop vocabulary list, problem sets and activity lesson plans and incorporate in their classrooms.

b. 2nd 9 weeks goal:
   Share experiences with colleagues and provide them the materials.

c. 3rd 9 weeks goal:
   Gather feedback from the larger group. Improve/expand vocabulary, problem bank, activity list.

d. 4th 9 weeks goal:
Meet with district group to share ideas and experiences and plan for next year.

4. **Assessments** -

   Of students:
   a. Teacher observation
   b. Product produced (design, build, operate)
   c. Presentation (data, analysis, and effectiveness of communication)
   d. Teamwork group function (teacher observation and student self and peer evaluation)
   e. Student feedback on their learning experience

Assessment of Program

5. **Resources** -

   a. Teaching colleagues
   b. Manufacturing employment data presentation from Todd Bennington (Borg Warner)
   c. ITEEA Web resources
   d. SAE Foundation for Science and Technology Education
   e. School media center
   f. Project materials (which will vary)
   g. Monetary support
   h. Parents
   i. Local businesses
   j. Administrative and district support

6. **Learning experiences**

   a. Share Todd’s presentation with teachers, parents, students
   b. The actual classroom problems and projects with students
   c. Feedback from colleagues
   d. Feedback from community (parents)

7. **Examples:**
   - Car building (hydrogen fuel cell, solar, wind, electrical, torsion, etc, basic to complex)
   - Catapult project
   - Globe building project
   - Rockets
   - Pop guns
   - Swimming pool
   - House
• Toothpick bridges

8. **Catapult project in detail:**
   a. Research siege engines and designs
   b. Investigate basic parameters for functioning catapults
   c. Form teams
   d. Choose design
   e. Construct, test, modify
   f. Launch
   g. Evaluate (design, process, team, each other, project)