Designing an educational dissection activity for a four cylinder engine

Overview
General Motors had donated several four cylinder Chevy Cruze engines to the university. The team was challenged with creating an activity that uses these engines for an educational purpose. Another challenge while creating the activity was designing the activity for a broad audience. Students of a wide range of ability levels participated in the activity.

Objective
To design a 4-cylinder engine dissection activity which allows students to explore the differences between single-cylinder engines and multi-cylinder engines

Approach
- The team gathered customer needs from the dissection course professor
- Several proposals were made keeping the customer needs in mind
- Concept generation and selection tables were used to narrow ideas
- Research was done to get an idea of what other universities did for their dissections
- Internal team members performed the dissection first, instructions were written
- Several other groups, selected by the team, performed the dissection using instructions
- The instructions were continually improved through analysis of test groups
- Upon completion of design and testing, students from the dissection course participated in the activity
- Conclusions were made and recommendations for similar projects in the future were made

Outcomes
- Penn State’s dissection course has a four cylinder engine dissection activity
- Students are able to explore the differences between a single-cylinder and multi-cylinder engine
- Students gain a physical understanding of how moving parts work together in a multi cylinder engine
- A dissection activity was produced to accommodate all levels of mechanical ability