2 Fast 2 Furious
High School Traffic Analysis and Safety

Target Grade Levels:
9-12

Subject Areas:
Technology Education & Engineering

Time Required:
7-8 45-minute class periods.

Lesson Objectives:
1. HS-ETS1-2. Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering
2. HS-ETS 1-3. Evaluate a solution to a complex real-world problem based on prioritized criteria and trade-offs that account for a range of constraints, including cost, safety, reliability, and aesthetics as well as possible social, cultural, and environmental impacts
3. Find mean, median, mode, and 85th percentile of speeds of NW 62nd Ave.
4. Analyze crash data
5. Explore traffic safety devices

Lesson Summary
Increase the scope of an introductory engineering class with a lesson in Civil Engineering – Transportation. Students will gain valuable insight into one of the most popular engineering disciplines, Civil Engineering, through research and analysis of a real-world engineering problem.

Students will get to experience hands-on data collection activities, research transportation engineering concepts like traffic safety devices, crash data, and calming measures. Students will then develop a solution utilizing the design process, producing a proposal that is supported by data and research.

Classroom interaction with a Civil Engineer from Iowa State University will provide direct instruction, demonstrations, and feedback to the students on their design proposals.

Students will gain valuable experience in field collection and analysis of data and use their findings to support a solution while experiencing a discipline of engineering that is not usually covered by an introductory engineering class. Students will make enduring connections with measurement and statistics that pertain directly to their everyday life.

Materials Required:
• Radar guns
• Computer, projector, internet connection

Courtesy Village of Tinley Park
Lesson Plans

This lesson will take students through an engineering design brief that requires them to act as if they are a team member in a civil engineering firm. The students begin by learning about the purpose of civil engineering and the transportation discipline.

Students will then take part in a spot speed study using speed capture devices (radar guns). From this they will analyze the data using statistics, finding mean, median, mode and the 85th percentile speed.

Students will then research historical crash data from Iowa DOT to determine before and after analysis of crashes along the NW 62nd corridor. This data will hopefully provide insight into the efficacy of roundabouts.

Students will also research other traffic control devices such as signals, signage, speed bumps, and other calming measures. Once they have collected their data, they will provide a written proposal that they will present to the Iowa State faculty.

At the conclusion of the unit, actual information from the city for the future roadways will be presented. Students will complete a reflection comparing their findings to those of the city planning council.

Differentiation

This collection of activities can be modified to fit many different classroom settings and student abilities. Supported by Unit III in the PLTW curriculum, the teacher and student have access to many supplemental resources to further help with the understanding of the statistics.

Teaching Tips

Instructors can utilize a variety of sources for data. State Department of Transportation websites, local city planning websites, and the National Highway Transportation Safety Board are among those that will have a variety of data regarding crash, violation, and traffic data.

Before heading out for data collection go over expectations with your students regarding pedestrian safety, equipment usage and other management issues (like weather appropriate clothing).