

Automotive Engineering

Classroom Grant

Career Center

Stan Barr

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Application Form

Report Fields

Project Name*

Name of project

Automotive Engineering

Amount Requested

Amount requested on application.

\$1,000.00

Grade Level

Please select grade level below.

High School (9-12)

Primary Subject Area

Please select the primary subject area of your grant.

Technology

School

Please select your school from the list below

Career Center

Number of Students Served

Please enter the number of students that will be served by this grant.

145

Project Cost

What is the total cost of your project?

4000

Statement of Need

Please describe the need for this project. For example, how will this project impact student learning?

Innovation, problem solving, design, fabrication, and collaboration are skills that students need to be successful in the real world. Bringing students together from many different vocational areas to work on a common project will allow them to use and improve these skills.

The departments involved in this cross-curricular cooperation will include, but not be limited to, Automotive, Engineering, Metal Manufacturing, Technical Math, and Graphics. The finished product will be something that the students will be proud of and that will be used by students in the future in the cooperating curriculum areas. Clustering students from different vocations provides them with a real life experience of working cooperatively on a common project. The students will learn from each other and have the opportunity to teach others what they have learned.

Students will work to develop partnerships with students from other departments as well as with businesses in the community to obtain expert advice and possible donated supplies or funds to complete the project.

We will construct a show vehicle from the ground up, or incorporate a body from a classic. The students will decide the type of vehicle to construct. This will give the car a classic or functional look with a highly technical design and function. This project will encourage the sharing of ideas, concepts and knowledge just as projects are developed and carried out in industry.

The process the students will use to complete this project is as important as the final completed product. The students involved in this project will benefit in many ways.

Communication, cooperation, research, presentation and leadership are all skills that will be used by the participants and are skills that are necessary to compete in today's job market. They will all be able to include participation in this project in their portfolios, job applications and on college and scholarship forms. It will be a project that they will remember for many years to come.

Primary Goal

Please describe the primary goal of the project and how it blends with School District 2 goals and curriculum.

The primary goal of this project is to allow students from different vocations to engineer, design, and build a custom vehicle. Students will be creative in the design aspect of the project while utilizing the principles of engineering, machining, and automotive technology to ensure its performance and functionality. The automotive technology program by design does not allow the students to be free and creative in their studies. It is designed to teach the students the theory and operations of vehicles. This cross-curricular project will allow students the opportunity to express their creativity and challenge their designs' functionality. Engineering students will be given the chance to bring their principles and theories to life. Cross curricular activities give students the opportunity to learn from each other.

Project Description

Briefly identify the major activities and materials involved in your project.

This project will consist of the design, engineering, fabrication and assembly of a custom automobile from the ground up. This vehicle will not be driven on the street, but will be used as a multi-purpose teaching aide for the participating departments. We plan to display the completed vehicle along with the story board of its' development at the Career Center SkillsUSA Car Show, Saturday Live, and other events to promote the Billings Career Center, the departments involved and the Education Foundation.

Students will use engineering software to design and draw various custom components for the vehicle. Computer simulation will be used to determine if the parts being designed will operate as intended before they are built. These parts will then be cut on the plasma table using the computer files.

The welding department will be responsible for fabricating various parts as well as the main frame of the vehicle. Welding techniques, quality, accuracy and stress tests will be incorporated to ensure proper fit as well as optimum strength.

The automotive department will be responsible for designing and installing the complete powertrain including the engine, transmission, axles, steering and electrical components. Students must work closely with students in engineering and welding to assure that the powertrain components are mounted and fit as intended. Many of these major components are already present in the automotive department, or could be salvaged from donated vehicles. These components will be rebuilt to assure proper operation.

The graphics department will work on the visual aspects of the vehicle body lines and presentation. They will also work to keep an accurate photo log of the progress of the project from inception to completion. A web page will be developed to allow students and community members to follow the construction progress.

The Technical Math class will be involved in various design aspects of the build, allowing them to gain hands-on experience with technical calculations.

Professional Development

If your project includes professional development how will it improve student performance?

This project does not include professional development activities.

Project Timeline

When will you implement your project?

Instructors from automotive technology, welding, machining, engineering, and graphics have already met and devised a basic plan for this project. We will begin the design aspect of this project this semester and would like to begin constructing various parts in the fall semester of 2014. It is anticipated that this project will take up to 2 full years to finish.

This project will be implemented in stages. The first stage will be to meet with the cooperating department instructors to divide up various aspects of the project. Students in each department will then research their specific aspect of the project to gain a knowledge background upon which to build. Periodic meetings will be held with student representative from each department presenting their findings, designs and suggestions. Students will then come together to make decisions about the various aspects of the build.

Plan for Evaluation

How will you evaluate student outcomes for your project?

Continuous evaluation will take place throughout the term of the project. The level of participation from each department as well as the students ability to cooperate and share ideas will be closely monitored. One component of the periodic department meetings will be to do an evaluation of the projects progress and how the departments are cooperating with each other. It will be important to assess how well the cross curricular aspects of the project worked.

The final evaluation will be the completed vehicle itself. Does it operate as designed and as intended? Are there aspects of the vehicle that could be improved? Was the project presented to the public and promoted to the highest level?

Project Budget

Please explain how the funds from this grant will be spent to support your project goal. You can either type or upload a project budget to show how funds will be used. Please identify other funding sources if applicable.

We estimate that this project will cost approximately \$4000 to complete. Students will generate money through various fundraising activities. We have also developed partnerships with various corporations in

Billings and will be obtaining sponsorships to help purchase parts and materials. NAPA is one partner that is interested in helping, and has already provided parts for the repair of the car that the SkillsUSA chapter gave to a community person.

Many of the materials, parts and components are available at the Career Center in the form of donated vehicles and steel.

Supervisor Approval*

I have received approval from my supervisor to apply for this grant.

yes

Attachment 1

Please attach any photos, pages from catalogs, or other documents below. This is completely optional.

Attachment 2

Attachment 3

File Attachment Summary

Applicant File Uploads