

The Car SUN SHIELD

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Type: Design Problem
Length: Two weeks research
Location: Class group brainstorming session 40 minutes / library research two weeks

Summary

The primary motive of this exercise is to provide experience in brainstorming and teamwork. The rules for brainstorming should be familiar to the students. This is intended to be used with first year engineering students to introduce some aspects of design such as research into alternate designs, ergonomics, and teamwork.

Students will be required to produce a drawing for a design of a new product that would fit between a car's dash and the windshield . This product would help protect the inside of the car from sun damage by lowering the temperature by at least 15 degrees. Other advantages of the product are that it can be pulled across the windshield and attached to the other side in just a few seconds, it is easily installed , and it is permanent yet does not block the drivers field of vision. The Sun Shield is constructed of a polymer material that can be reversed . In the winter, when the Sun Shield is reversed it will help heat the car through solar energy.

Report: Two or three pages plus a sketch of the new design.

ABET Descriptors

Engr Sci Content: First Year Engineering
Type: Component
Elements: Ergonomics, synthesis
Features: Development of student creativity, open ended problem,
consideration of alternative solutions, feasibility considerations

Constraints: Time, economic factors, aesthetics
Effort: Team

The Car SUN SHIELD

Split up into groups and use brainstorming techniques to generate ideas about designing the Car Sun Shield. Read the following advertisement to obtain details of what the product is supposed to do. Improve on the claims if you can.

The Car SUN SHIELD

Summers are hot and winters are cold. What else is new? Protect the interior of your car with the second generation Sun Shield. The Shield is easily installed in your car and can be drawn across your windshield in seconds. No more struggling with cardboard sun shields that take several minutes to unfold and stretch across the windshield. Our Sun Shield is made of a new polymer material that blocks the sun's rays and is guaranteed to lower the interior temperature of your car by at least 15 degrees even on the hottest day. But that is not all it can do. In the winter flip it over and unroll it in the opposite direction and it will allow the sun's solar energy to warm your car's interior. The second generation Sun Shield comes in three sizes in order to fit every windshield size. Sun Shields are also made for your back windshields. Sun Shields weigh less than two pounds and can be installed in minutes with ordinary tools.

Order today 1-800-352-7365

REPORT: Group reports (two to three pages) with a sketch of the design are due in two weeks.

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Engineering Notes:

Some points that could be mentioned if students get stuck for ideas

- Investigate types of materials that could function as the ad claims. Research if there is really a material that will functioned as described.
 - What is the range of sizes of automobile windshields? Could the Sun Protector be made in only three sizes and still fit all size windshields?
 - How would the sun protector function mechanically? How is it attached to the car?