

Element G: Construction of a testable prototype

This entry would be likely to receive a **score of 0**, based on the EDPPSR. The entry consists only of three photographs illustrating the installation of the device that was designed by the student(s) to prevent tree damage during an ice storm. Because an explanation of the final prototype iteration is missing altogether, this entry cannot receive a higher score. From the images alone, there is no evidence that the prototype would facilitate testing by suitable means for any of the design requirements.

The absence of any explanation suggests that the student(s) did not even consult the EDPPSR before including the artifacts for Element G; it is likely that they merely looked at the element title and interpreted it to mean evidence that a prototype was actually built.

Engineering Design Process Portfolio Scoring Rubric Component and Element Titles

Component I: Presenting and Justifying a Problem and Solution Requirements

- Element A: Presentation and justification of the problem
- Element B: Documentation and analysis of prior solution attempts
- Element C: Presentation and justification of solution design requirements

Component II: Generating and Defending an Original Solution

- Element D: Design concept generation, analysis, and selection
- Element E: Application of STEM principles and practices
- Element F: Consideration of design viability

Component III: Constructing and Testing a Prototype

- **Element G: Construction of a testable prototype**
- Element H: Prototype testing and data collection plan
- Element I: Testing, data collection and analysis

Component IV: Evaluation, Reflection, and Recommendations

- Element J: Documentation of external evaluation
- *Element K: Reflection on the design project*
- Element L: Presentation of designer's recommendations

Component V: Documenting and Presenting the Project

- Element M: Presentation of the project portfolio
- Element N: Writing like an Engineer

Please Note: Elements M and N require no submission from the portfolio author(s) and are intended to be scored based on the portfolio work as a whole from what has been submitted from Elements A through L

Element G: Construction of a testable prototype

5 The final prototype iteration is clearly and fully explained and is constructed with enough detail to assure that objective data on all or nearly all design requirements could be determined; all attributes (sub-systems) of the unique solution that can be tested or modeled mathematically are addressed and a well-supported justification is provided for those that cannot be tested or modeled mathematically and thus require expert review.

4 The final prototype iteration is clearly and adequately explained and is constructed with enough detail to assure that objective data on many design requirements could be determined; most attributes (sub-systems) of the unique solution that can be tested or modeled mathematically are addressed and a generally supported justification is provided for those that cannot be tested or modeled mathematically and thus require expert review.

3 The final prototype iteration is clearly and adequately explained and is constructed with enough detail to assure that objective data on some design requirements could be determined; some attributes (sub-systems) of the unique solution that can be tested or modeled mathematically are addressed and an adequately supported justification is provided for those that cannot be tested or modeled mathematically and thus require expert review.

2 The final prototype iteration is explained only somewhat clearly and/or completely and is constructed with enough detail to assure that objective data on at least a few design requirements could be determined; a few attributes (sub-systems) of the unique solution that can be tested or modeled mathematically are addressed but there may be insufficient justification for those that cannot be tested or modeled mathematically and thus require expert review.

1 The final prototype iteration is only minimally explained and/or is not constructed with enough detail to assure that objective data on at least one design requirements could be determined; no more than one attribute (sub-system) of the unique solution that can be tested or modeled mathematically is addressed and any attempt at justification for those that cannot be tested or modeled mathematically and thus require expert review is missing.

0 Any attempt to explain the final prototype iteration is unclear or is missing altogether; there is no evidence that the prototype would facilitate testing by suitable means for any of the design requirements.



Tree Ice Accumulation Prevention Device

CONSTRUCTION OF A TESTABLE PROTOTYPE 

