

NAME _____

Part 2: Design the prototype crash barrier

Describe your design, with words and sketches.

Part 3: Construct the prototype crash barrier

Part 4: Evaluate the prototype crash barrier

Test your crash barrier and describe its performance (strengths and weaknesses).

Part 5: Revise and re-evaluate

Revise your design and then conduct a final performance evaluation. Describe its strengths and weaknesses.

Part 6: Share your findings.

Prepare a brief presentation to share with your class.

Grading Rubric

Criterion	Criterion Not Met (0)	Needs Improvement (1 pt)	Satisfactory (2 pts)	Excellent (3 pts)
Crash Barrier Design	Did not test any materials and configurations; or, barrier was clearly <i>not</i> designed based on supporting data.	Tested various barrier materials, or tested different configurations, but did not test both.	Tested materials and configurations, but it was not clear how the test results informed the design of the barrier.	Tested materials and configurations, and data were clearly used to inform and/or support the barrier design.
Crash Barrier Construction	Crash barrier was <i>longer than 12 cm</i> , and had <i>mass greater than 50 g</i> .	Crash barrier was <i>longer than 12 cm</i> , but had <i>mass less than 50 g</i> .	Crash barrier was <i>shorter than 12 cm</i> , but had <i>mass greater than 50 g</i> .	Crash barrier was <i>shorter than 12 cm</i> , and had <i>mass less than 50 g</i> .
Crash Barrier Performance	Maximum impact force was <i>greater than 40 N</i> .	Maximum impact force was <i>between 25 N-40 N</i> .	Maximum impact force was <i>between 10 N-25 N</i> .	Maximum impact force was <i>less than 10 N</i> .
Report Elements	Did not submit a written report.	Report was submitted but was missing one or more of its critical components: test phase data and observations; a prototype design sketch; or, design revisions.	Report was submitted with all critical components, but the components were incomplete: test phase observations and data were minimal; design sketch was incomplete or not detailed; design revisions were minimal or presented without reasoning.	Documented all materials, data, and observations from the test phase. Included a complete design sketch with concise descriptions of the barrier components. Clearly documented strengths and weaknesses of the prototype, and indicated all revisions to its design with reasoning.
Class Presentation	Did not present a report to the class.	Presentation did not include any critical information regarding design choices and revisions.	Presentation included information regarding design choices and revisions, but did not elaborate on how testing results informed those choices.	Presentation was thorough and concise, and included participation from all group members. The information presented clearly reflected ideas and revisions based on testing.