

Crash Science and Crumple Zones-Engineering and CAD for High School Physics Rubric

	<b>(4) Exceeds Expectations</b>	<b>(3) Meets Expectations</b>	<b>(2) Below Expectations</b>	<b>(1) Far Below Expectations</b>	<b>(0) Incomplete</b>
<b>Onshape Tutorial</b>	Entire Onshape tutorial completed. Student demonstrates exemplary understanding of the concepts.	Entire Onshape tutorial completed. Student shows enough understanding to be able to move on and complete the project.	Most or all of the Onshape tutorial completed, but student shows a lack of understanding of important concepts required for successful manipulation of the app to meet project objectives.	Onshape tutorial not completed (or completed with little effort). Student demonstrates few of the skills needed to move forward in the project.	Onshape tutorial incomplete. Student does not have the understanding needed to move forward in the project.
<b>Team Brainstorming/ Developing a Plan for the Prototype</b>	Student actively participates in brainstorming and pre-planning. Student takes part in producing a well thought out sketch before starting the CAD process.	Student works with team to create a plan for a prototype and submits a sketch before starting the CAD process.	Student is part of a team that creates a plan and a sketch, but may not fully participate in the process.	Student participates very little in the team brainstorming and/or is part of a team that neglects to turn in a sketch.	Student does not participate in the brainstorming process.
<b>Engineering the Prototype in Onshape</b>	Student takes an active role in designing the prototype using Onshape. 3D printed prototype is functional and exceptionally well-suited to its task of protecting the Slam Stick accelerometer in the collision.	Student participated in the design of the prototype in Onshape. 3D printed part is functional.	Student may have let others in the team do most of the work in Onshape and/or part may not be functional.	Student did very little to assist the team in the creation of the 3D part in Onshape.	Student did not contribute in a meaningful way to the creation of a 3D part in Onshape and/or team did not turn in a part for printing.
<b>Testing of Prototype and Analysis of Results</b>	Student actively engages in prototype testing with teammates (or online with the STEM Explorer team). Student shows clear understanding of the relationship between the data collected and the video evidence of the collision. Student can evaluate the effectiveness of the prototype and make and defend intelligent arguments about its performance.	Student works with teammates (or with the STEM Explorer team online) to test the prototype and is able to explain the results of the tests. Student is able to identify pros and cons of the prototype, but may not be able to draw all necessary connections between prototype design and results obtained.	Student shows only partial understanding of the results of prototype testing. Student may not have been actively engaged in prototype testing with the team and/or is not able to answer questions concerning functionality.	Student may not have participated in either the prototype testing or the presentation.	Student did not take part in any prototype testing or presentation.

	<b>(4) Exceeds Expectations</b>	<b>(3) Meets Expectations</b>	<b>(2) Below Expectations</b>	<b>(1) Far Below Expectations</b>	<b>(0) Incomplete</b>
<b>Presentation of Results</b>	Presentation is organized and professional, representing a clear understanding of the relationship between the crumple zone structure created and its function. Student is able to provide a ready response to questions.	Student explains what was learned in the design process and is able to answer questions. Presentation is complete and adequate.	Presentation may be lacking in professionalism or incomplete. Student may struggle answering questions about the design process and/or results.	Presentation is incomplete or may lack data. Student may be unable to explain the results. Student may not have played an active role in the presentation.	Presentation not turned in.
<b>Working in a Collaborative Team</b>	Student takes an active role and makes a positive contribution to the team. Student is always engaged, reliable, and respectful of others in the team while presenting opinions, but is able to compromise when needed.	Student makes a positive impact on the team by taking an active role in the project from beginning to end.	Student is often not engaged in the project with teammates. Student shows lack of interest and/or is confrontational with other members of the team. Student may be unreliable.	Student allows others to do the majority of the work and is rarely engaged. Student may have withdrawn and knows little about the status of the team's progress.	Student does not work with the team. Student shows little to no involvement.
				Total Score /24	Grade: _____
<b>Comments:</b>				Percentage: _____	