

Learning Target 9: I can apply science and engineering ideas to design, evaluate, and refine a device that minimizes the force on a macroscopic object during a collision.

Areas of Focus	4-Mastery	3-Proficient	2-Approaching	1-Not Yet
Design	<ul style="list-style-type: none"> - includes all 4 of the following components: <ul style="list-style-type: none"> - nose - crumple zone(s) - backstop - method of preventing barrier from lifting off ground - one bullet point statement per component describing the rationale for including each of the above components in design 	<ul style="list-style-type: none"> - includes 3 of the following components: <ul style="list-style-type: none"> - nose - crumple zone(s) - backstop - method of preventing barrier from lifting off ground - one bullet point statement per component describing the rationale for including each of the above components in design 	<ul style="list-style-type: none"> - includes 2 of the following components: <ul style="list-style-type: none"> - nose - crumple zone(s) - backstop - method of preventing barrier from lifting off ground - one bullet point statement per component describing the rationale for including each of the above components in design 	<ul style="list-style-type: none"> - crash cushion building has begun, but is not complete
Evaluate	<p>Initial Design</p> <ul style="list-style-type: none"> - Component function. For each component, do the following: <ul style="list-style-type: none"> - 1 (low) - 4 (high) rating score - One statement analyzing successful function of each component <p>Final Design</p> <ul style="list-style-type: none"> - repeat the Initial Design steps 	<p>Initial Design</p> <ul style="list-style-type: none"> - Component function. For each component, do the following: <ul style="list-style-type: none"> - 1 (low) - 4 (high) rating score - One statement analyzing successful function of each component <p>Final Design</p> <ul style="list-style-type: none"> - repeat the Initial Design steps 	<p>Initial Design</p> <ul style="list-style-type: none"> - Component function. For each component, do the following: <ul style="list-style-type: none"> - 1 (low) - 4 (high) rating score - One statement analyzing successful function of each component <p>Final Design</p> <ul style="list-style-type: none"> - repeat the Initial Design steps 	Preparing to evaluate crash cushion
Refine	<ul style="list-style-type: none"> - initial design documented (photo of labeled scale drawing) - design tested - data recorded - modifications listed - Final design tested - new data recorded (you might repeat this process a 3rd time... :) 	<ul style="list-style-type: none"> - initial design documented (photo of labeled scale drawing) - design tested - data recorded - modifications listed - Final design retested - new data recorded 	<ul style="list-style-type: none"> - initial design documented (photo of labeled scale drawing) - design tested - data recorded - modifications listed - Final design retested - new data recorded 	<ul style="list-style-type: none"> - initial design documented (photo of labeled scale drawing) - design tested - data recorded - modifications listed - Final design retested - new data recorded
Minimize Acceleration	<ul style="list-style-type: none"> - design a crash barrier which minimizes the acceleration of a cart to below 10m/s². 	<ul style="list-style-type: none"> - design a crash barrier which minimizes the acceleration of a cart to below 16m/s². 	<ul style="list-style-type: none"> - design a crash barrier which minimizes the acceleration of a cart to below 22m/s². 	<ul style="list-style-type: none"> - Working towards design or accel is above 22m/s².
Calculate Force	<ul style="list-style-type: none"> - correctly calculate force from mass and acceleration data 	N/A	<ul style="list-style-type: none"> - incorrectly calculate force 	<ul style="list-style-type: none"> - haven't calculated force yet

Crash Cushions Engineering Proposal

How to get to the next level:

Additional Resources:

- Design
 - Review the following for information and inspiration:
 - https://www.google.com/search?rlz=1CAOLTF_enUS787US787&tbm=isch&sa=1&ei=kW4XXqSxA5fV-gTI04boBA&q=crash+cushion+components&oq=crash+cushion+components&gs_l=img.3...159484.161461..162151...0.0..0.198.941.7j3.....0....1..gws-wiz-img.....0i7i30.kjtJOj33C9Y&ved=0ahUKEwjvFPWkPfmAhWXqp4KHcipAU0Q4dUDCAc&uact=5&safe=active&ssui=on#imgsrc=jZxwKzjsB1jDAM:
 - https://fdotwww.blob.core.windows.net/sitefinity/docs/default-source/construction/construction/engineers/mot/presents/crash-cushion.pdf?sfvrsn=c433b022_0
- Evaluate
- Refine
- Calculate Force

Still to use:

W-U day 94

F7 Day 94: 1. Quiz (15 min) 2. Notebook check. 3. build/test/modify. Goal: finish building

M10 Day 95: build/test/modify Goal: done building. Some final testing

T11 Day 96: Final testing. Exam prep

W12 Day 97: Exam. More testing if necessary. Knowledge Inventory for HW. Growth Activity

T13 Day 98: 101 Knowledge Inventory - thermodynamics

F14 Day 99: 102 Phases/changes Lab

Mholiday

T18 Day 100: short tuesday