

### The Physics of Safety: Using the Concepts of Energy & Momentum

**TASK**: When we stop suddenly we can cause injury. Your task is to explain how your item/technique works to keep us safe and reduce damage in an oral/visual presentation. You must include:

- → #1. Visual (email it to <u>chudecki@wellingtoncdsb,.ca</u>) \*1 or 2 pictures at most! I'll put on 1 slide.
- → #2. How device is constructed and what it does. (Briefly)
- ➔ #3. Physics of Safety:

What is the danger in this situation?

How the item/technique work to keep us safe correctly using the concepts of:

Momentum
 Impulse
 Force
 \*\*MUST PROPERLY DISCUSS ALL FOR BEST MARKS.



TIME LIMIT: You have 3 minutes maximum so practice your presentation and time it!

**RESEARCH**: Your research will be assessed. Make sure to follow instructions. You must also include 'References' in proper APA format.

### TOPICS:

1. Car crumple zones	13. Playground wood chips/mulch
2. Protective features of football/hockey helmet	14. Safe landing (gymnastics)
3. Crash nets for downhill skiing	15. Safe falling (gymnastics)
4. Driver wheel airbag	16. reverse rockets for lunar landings
5. Break away telephone poles	17. brake falls in martial arts
6. Bungee cord for bungee jumping	18. new basketball rims (that break away with slam dunks)
7. Safe landing technique for sky diver	19. Stunt actors – crash bags (when they fall 'to their
8. Proper way to fall (so as not to break an arm)	death' off a high rise)
9. Drop zone at Wonderland – why don't riders get hurt?	20. Rollercoasters – how do riders stay in/safe?
10. Shock absorbers	21. Child car seats
11. Otter box	22. Strategic building explosions.
12. Shock doctor mouth guards	23. Topic of your choice (must be OK'd by teacher)

# <u>Research Notes</u>: are to be dated & in point form & in your own words. The website/source must be listed above as a title. For example:

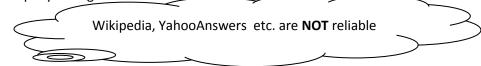
www.howstuffworks.co	m Found April 1, 2013	
- Brake	Brakes: friction between pads and wheels	
- Brake	Brakes $ ightarrow$ force opposing the motion	
- Bicycl	es – usually brakes on both wheels	

#### Only reliable, **un**biased resources.

Reliable - government agencies (.gov), educational institutes (.edu), medical facilities (.org), etc.

Biased – a website that has predictable (and not necessarily accurate) information.

ie: A company selling



	Criteria – research notes
Communication	For full marks, research notes must follow guidelines given above. A minimum of 2 source
A1.7	must be used.
Finds, documents	
information correctly	
Using reliable,	
unbiased sources	
	/5

## Note: You will <u>not</u> be allowed to present unless you have your research notes done.

#1 & #2	Criteria – Visual & explanation of how device constructed / works	
K&U C2.1 Uses visual to explain construction of item or demonstrate technique. (what's it do?)	For full marks, a useful visual must be present and student must make reference to it during the presentation. The construction of device and correct explanation of what device does is included.	
,,	/5	

Criteria – physics of this device.				
For full marks, the physics of this device is correctly explained without any significant omissions.				
Student must include:				
Danger	/1			
Momentum	/3			
Impulse	/3			
Force	/3			
	4.0			
Total	/10			
Did you practise and time yourself? If yes, how long was your practice presentation?				
	For full marks, the physics of this device is correctly explained without any signific Student must include: Danger Momentum Impulse Force Total			

Additional Comments: