

The Physics of Car Safety Lesson Plan

Date	16/5/2000
Subject	A.L. Physics
Topic	The Physics of Car Safety
Form	6 Science
Number of Students	30

Objectives
By the end of the lesson students should be able to:
1. Aware the social issue of car accident, crash.
2. Aware and explain the importance of car safety.
3. Appreciate the physics involve in car safety.
4. Explain and use the physics involved.

Development (Lesson 1)

Time	Teacher Activity	Student Activity	Remarks	Objectives Check
0-15	Set	Browse the web page (A Glance at Car Accidents) and discuss the issue		1
16-20	Introduce briefly the safety, passive safety	Observe and answer questions.		2
21-30	Lead the discussion	Observe and discuss	Video: "Collision Time Experiment"	4
31-38	Remind students about the parameters in the simulation	Play around with the simulation	Simulation: Conservation of Momentum	4
39-40	Closure: assign H.W.		H.W.: Search relevant information from the web	

Development (Lesson 2)

Time	Teacher Activity	Student Activity	Remarks	Objectives Check
0-10	Set: Ask students about their finding	Present & discuss		3
11-30	Introduce the relevant physics in crash, collision). i.e. inertia, momentum and impulse	Observe and answer questions.		4
31-38	Lead the discussion	Browse the web site (Safety belt) and discuss the issue	Video: "Safety Belt Experiment"	3
39-40	Closure: assign H.W.		H.W.: Calculation type ques	

Development (Lesson 3)				
Time	Teacher Activity	Student Activity	Remarks	Objectives Check
0-5	Set: Recall the physics learnt.	Answer questions		
6-20	Introduce the other safety device (e.g. Air bag) and discuss the physics involved	Observe and answer questions.	Web Page: Safety Device	2,3
21-25	Introduce active safety	Browse the web site (Active Safety) and discussion the issue		3
26-30		Watch ABS video		
30-38	Introduce the physics involved in ABS, i.e. limiting friction, inertia etc.	Observe, discuss and answer questions.		3,4
38-40	Closure: Assign H.W.		HW: Browse the internet about the ABS and calculation type questions	

Development (Lesson 4)				
Time	Teacher Activity	Student Activity	Remarks	Objectives Check
0-5	Set: Ask students about their finding	Present & discuss		3
6-10		Watch the "Apply braking force on a particular wheel"		
11-25		Experiment: The Effect of Applying Braking Force on Different Wheels		3,4
26-40	Lead the discussion	Discuss the experimental findings		3

Development (Lesson 5)				
Time	Teacher Activity	Student Activity	Remarks	Objectives Check
0-5	Set: Recall what they have found last lesson	Answer questions		
6-25	Introduce the rotational dynamics	Observe and answer questions		4
26-40	Show different traction control systems and ask student to find out the physics involved	Observe and discuss	Announcement: quiz next lesson	

Development (Lesson 6)				
Time	Teacher Activity	Student Activity	Remarks	Objectives Check
0-5	Set: Recall what they have learnt last lesson	Answer questions		3
6-20	Explain, the physics involved in TCS	Watch the TCS video, discuss and answer questions		3,4
21-40		Quiz		

Materials & References

Car and Driver (人車誌), April 1999
Car and Driver (人車誌), Jan 1999
Automobile (車主), March 1999
VCM 視像汽車雜誌 Vol. 3, 1999
VCM 視像汽車雜誌 Vol. 5, 1999
Coronet (皇冠季刊), Summer 1996
<http://www.info.gov.hk/police/>
<http://www.carsafety.com/>
http://www.hwysafety.org/vehicle_ratings/ratings.htm
<http://www.nrma.com.au/crashtests/>
<http://www.osa.go.jp/>
<http://www.nhtsa.dot.gov/cars/>
Tom Duncan, Advanced Physics for Hong Kong, 2nd ed.