|  |  |
| --- | --- |
| Title  | THE PHYSICS OF ROAD SAFETY ROAD COLLISIONS – CAN NEWTON PROTECT YOU? |
| Subject(s) | Physics |
| Learning goal(s) | Students are able to:* Devise a simulation experiment to study the applications of Newton’s 2nd and 3rd law in road safety.
* Identify the impulse of a force (constant and variable force) in two objects during collision. Infer the consequences during real life situations (i.e. road accident) using applications of the conservation of momentum and kinetic energy - correlate with Newton’s 3rd Law.
* Employ their understanding of elastic and inelastic collision to justify the need of well-functioning airbags and bumpers.

Compare and identify similarities/differences between road safety in real-life situations to simulations and analyzations using Newton’s laws. |
| Keywords | Newton’s laws | Collision |
| Speed | Safety |
| Time | 3-5 teaching periods |
| IBL | A self-designed and built research of basic rules of the Highway Code in both a simulation and real-life including:* speed limit,
* usage of seatbelt,
* good condition of car focusing on airbags and tires
* road design

road usage |
| Achievement | Students are fully involved in building their simulation as realistic as possible for each of the factors they are investigating. Set up uses simple everyday materials that anyone can find, and teams work together in creating the most representative simulation for each of the factors they are investigating. Group work is involved for each set up. Collaboration and practical skills are highly required. The teacher can be called up to help with the best recording method of their findings as well as to facilitate their thinking regarding the limitations of their simulation. Students are free to think, communicate and decide on various ways to perform their investigation as well as record it, allowing for a variety of working methods and level of achievement.  |
| Context | Road safety is a context which is highly relevant in everyone’s lives containing many complex issues.  |
| Culture | Every country has different rules concerning road design and road usage, influencing countries’ road safety. This makes the topic multicultural. |
| Fundamental Values | Collaboration. Creativity. Respect of the highway code. Social awareness to protect the vulnerable users of the road network  |
| SSI/RRI | Road usage and the resulting number of casualties increase every year, making road safety one of the leading social scientific issues of the present and the future. |
| Copyright |   |
| Url |  |