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Teaching –learning module compiled by the PARSEL consortium  
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Popularity and Relevance of Science Education for scientific Literacy



# Traffic Accident: who is to blame?

A grade 10-11 science (physics) module on  
Coefficient of Friction and Skidding

## Abstract:

A boy was knocked down by a van on a pedestrian crossing linked with traffic-lights. The boy was slightly injured. A reconstruction of the accident was undertaken in an attempt to determine blame.

This series of lesson assumes that the students are familiar with the laws of motion, but explores the possibility of introducing the idea of friction by an examination of skid marks related to an actual traffic accident. The students are thus introduced to the coefficient of friction through trying to solve an actual societal problem.

Sections included		
1.	<a href="#">Student activities</a> (for the students)	Describes the scenario in more detail and the tasks the students should perform
2.	<a href="#">Teaching guide</a>	Suggests a teaching approach
3.	<a href="#">Assessment</a>	Gives suggested formative assessment strategies
4.	<a href="#">Teacher notes</a>	States the theoretical physics and gives the expected calculations

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**Developer:** Jack Holbrook (adapted from *Physics of Road Traffic Accidents* by P.K.Tao: Hong Kong, Oxford University Press, 1987)  
**Institution:** International Council of Associations for Science Education (ICASE)  
**Country:** UK

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**Overall Objectives/Competencies:** The students are expected to:

- \* understand the problem;
- \* draw a labelled, reconstruction diagram of the situation;
- \* undertake suitable calculations solve the traffic problem applying the laws of motion and the concept of coefficient of friction;
- \* undertake experiments to determine the coefficient of friction
- \* be willing to show perseverance to understand the issue and participate in determining whether the van driver is to blame for the accident
- \* cooperate by participating as a member of a group in a discussion on the outcomes of the calculations to determine whether to apportion blame;
- \* understand the relationship between change in kinetic energy of motion and work done against friction and hence be able to apply to derive and apply the formula,  $v = (2ugs)^{1/2}$  ;
- \* decide, with justification, whether the van driver was to blame for the accident.

**Curriculum content:** Friction, Coefficient of friction, Work done against friction.

**Kind of activity:** Interpretation of data by drawing a reconstruction diagram; Calculations based on real life data covering laws of motion and coefficient of friction; group work on making a justified decision after calculations have been successful performed.

**Anticipated time:** 4 lessons

**Prior Learning:** Laws of Motion, Kinetic Energy

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This unique teaching-learning material is intended to guide the teacher towards promoting students' scientific literacy by recognising learning in 4 domains – intellectual development, the process and nature of science, personal development and social development.

Its uniqueness extends to an approach to science lessons which is designed to be popular and relevant. For this the approach is intentionally from society to science and attempts to specifically meet student learning needs.

This uniqueness is specifically exhibited by:

1. a society related and issue-based title (supported in the student guide by a scenario);
2. student-centred emphasis on scientific problem solving, encompassing the learning of a range of educational and scientific goals;
3. including socio-scientific decision making to relate the science acquired to societal needs for responsible citizenship.

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