

Keeping society moving – how will transport work in the future?



Objectives:

Identify key means of transport in our society, how they work, why they are important, and problems they will face in the future.

Identify that friction and gravity are the two major forces affecting moving objects.

To improve understanding of these forces using practical work devised by the students.

To gain experience with new laboratory equipment (air track).

To use this equipment in novel ways to examine what factors affect moving objects.

Learning Outcomes:

On successful completion of this module students will be able to:

Summarise modes of transportation vital to modern society, and the power sources by which each works.

Recall that friction and gravity determine how objects move.

Design practical tasks to investigate the effect of friction and gravity on falling and moving objects.

Predict and justify the probable behaviour of objects placed in a force field..

Curriculum Content

Friction and gravity and their effects on moving objects. Speed, acceleration and velocity. Current and future energy sources used by vehicles in society.

Student activities

Concept maps were produced by each group to summarise the students' prior knowledge of forces and modes of transport.

Simple experiments were designed to show the effects of forces on falling objects, and moving objects such as cars and trolleys.

After demonstration of the apparatus, the students then used the air track to control the forces on a moving trolley, and finally used the apparatus in novel ways to examine how the movement of objects was affected.

Literature and Internet sources

Department of Education and Science. Leaving Certificate Physics Syllabus: Ordinary and Higher Level. Stationary Office: Dublin. O'Regan, Dan. (2004). Real World Physics. Folens, Dublin.

Rocard Report: European Commission, Community Research. (2007). Science Education Now: A renewed pedagogy for the future of Europe. http://ec.europa.eu/research/science-society/document_library/pdf_06/report-rocard-on-science-education_en.pdf

Results:

•After completing this inquiry-based module, there was a significant increase in the number of participants who felt that the topic was important and relevant to their everyday lives and society.

•The majority of the students reacted positively to the problem-based approach to a new topic, compared to their previous experiences. There was also a favourable reaction to the scenario used to introduce the topic.

•It was noted however that students found an inquiry-based approach difficult to engage in immediately, in spite of their previous experience with coursework tasks, and the structured introductory tasks provided in this intervention module.



Evaluation:

The topic was clear and relevant to the everyday lives of the students.

It was not gender based and was equally attractive to both boys and girls. This was in contrast to how previous lessons had been viewed.

It introduced Physics experiments and equipment normally reserved for the Leaving Certificate curriculum.