The **ScienceMath** Project: **Toy car - acceleration**
Kaarina Merenluoto, Anu Tuominen, Tarja-Riitta Hurme,
University of Turku,
Department of Teacher education,. Finland

Background

General didactical Background

In physics, there are many phenomena that students find difficult to understand. For science education, one important feature in learning and teaching is also to learn to model how scientists and mathematicians so that they set a hypothesis, making an experiment, and using the results to construct or revise a scientific model. Reusing or generalizing models are considered as central activities in science education (e.g. English, 2009). Through modelling, the students are engaged in solving problems of real world context which motivate them to learn and their every-day experiences can be utilized. Further, the students need to make sense of the situation so it is meaningful for them. By planning their own experiments the students need to engage working with their current knowledge and activating their conscious thinking. To decrease physics anxiety, we propose a series of task where familiar objects like toys are used in experimenting and modelling physics phenomena.

Some times it is possible that the anxiety experienced in studying science and mathematics prevents students to create meaningful learning experiences. The physics anxiety is real for many pre-service primary teachers and as teacher educators we should be able to help those students. If pre-service teachers' anxiety could be decreased, it could benefit their future students. When the future teachers could be able to acknowledge children's possible anxiety, they could have possibilities to arrange meaningful learning environments. This current material is originally designed for pre-service primary teachers' (later used the term "students") science and mathematics education, but it also is useful on the lover and upper levels of education.

Scientific and mathematical background

In physics, *velocity* (v) is defined as a rate of change of position defined by speed and direction. The rate of change of velocity over time is referred to as *acceleration*

Acceleration = $\dfrac{Change\_of\_speed}{Change\_of\_time}$, that is $a = \dfrac{\Delta v}{\Delta t}$,

where *a* means acceleration, Δv is the change of speed and Δt the change of time.

The idea of teaching implementation

In this teaching implementation the purpose is to use toys to teach and model the concept of acceleration and emphasis the importance to use seat belts while driving the car.