

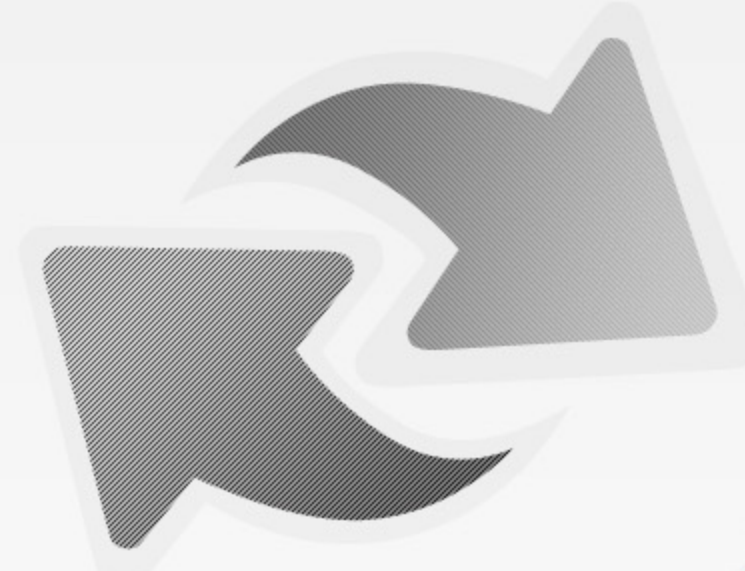
# Welcome to Science-ercise!

Feel fascinated about Physics? Ever wonder what mechanics is all about? Or are quantum physics really a mystery? Let us show you how these theories and principles can be learned easily and effectively using specially designed computer software! You will discover a whole new way of teaching and learning physics with our special Science-ercise project.

## Our People:

- **Dr Andrew Fluck**  
Senior Lecturer in Information Technology with University of Tasmania
- **Professor Dev Ranmuthugala**  
Director of National Centre for Ports and Shipping at the University of Tasmania
- **Dr Christopher Chin**  
Senior Lecturer in Mathematics at the University of Tasmania

## Our Partners:

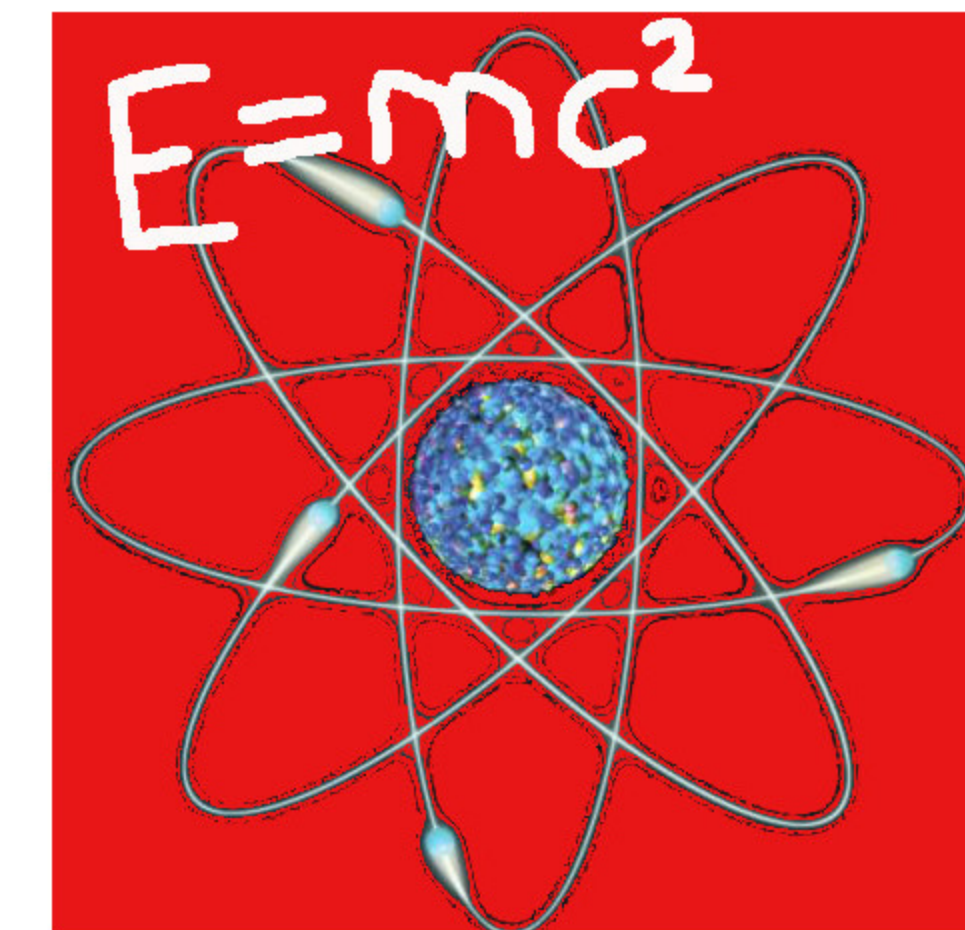


# SCIENCE-ERCISE

TRANSFORMING THE WAY  
WE TEACH SCIENCE  
IN SCHOOLS

## This project is approved by:

Human Research  
Ethics Committee (Tasmania) Network  
Catholic Education Australia  
Department of Education, Tasmania



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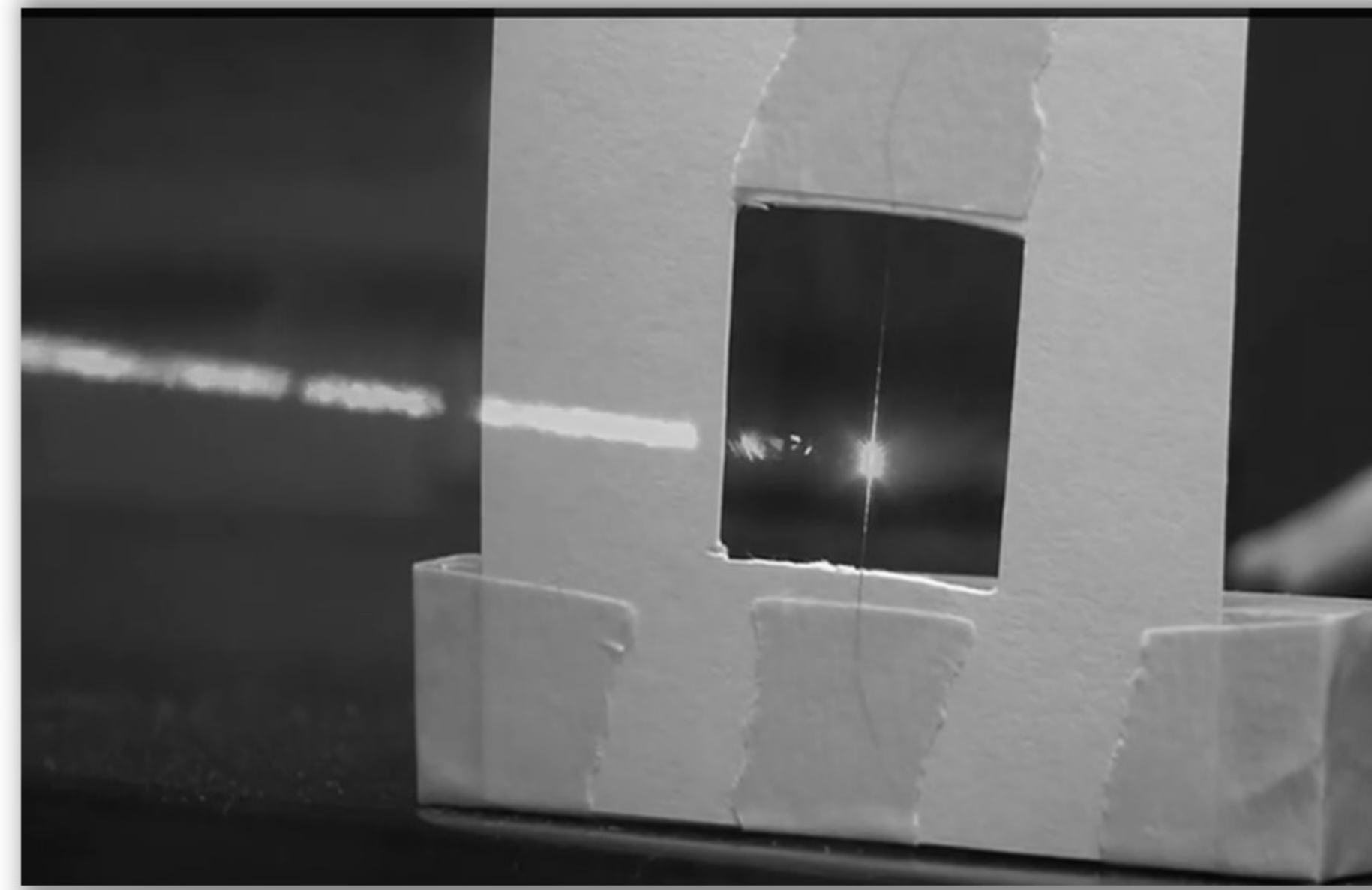
## What is Science-ercise?

The Science-ercise project demonstrates how modern physics can be easily understood by Year 6 students. With specially written lessons and professional software, Science-ercise shows you the knowledge and skills:

- 1) to understand quantum mechanics, the dual nature of light, twins paradox, and special relativity and its everyday use.
- 2) to use spreadsheets for iPad or in Excel to automate the complex calculations in order to expand your understanding about Physics theories and their application.
- 3) to match physics theories and applications to everyday living.

## Benefits for your school:

- 1) Free eWorksheets for teachers and students
- 2) Free staff training (half day) in Tasmania
- 3) The project addresses outcomes in Mathematics and Science
- 4) Superb opportunity to highlight student success with computers in your local community



## OUR PROJECT

With Science-ercise, we aim to prepare students for the introduction of the Australian Curriculum, particularly in the area of Science.

CALCULATION	
Time the travelling twin is away (t)	years
Speed of the travelling twin (v)	fraction of speed of light (c)
After the journey, the travelling twin is younger by =	$t - t \sqrt{1 - \frac{v^2}{c^2}}$ 0.00 years

## OUR LESSONS

The three modules related to the Australian Curriculum content learning descriptors were: Motion, Light and Relativity. We use computers to express modern physics in visual ways, and provide students with software. The project will therefore remove the fear of advanced ideas and boost numbers in tertiary studies.

## Description of classroom activities to be undertaken

- 1) Video presentation explaining vocabulary and basic concepts
- 2) Trajectory cars to test speed, velocity and time
- 3) Nerf guns to reinforce concept of light waves
- 4) Cannon shot to test trajectory, angle and distance
- 5) Laser & hair experiment to test the particle properties of light
- 6) Video presentation to present and reinforce Twins Paradox concept of relativity of space-time
- 7) Hands-On Discovery projects supported by eWorksheets with calculation to provide assessment solutions

## HOW CAN YOU BE PART OF THE PROJECT?

Your school can be part of the project if you run classes where every student has access to a computer.

## WHAT YOU NEED TO DO:

- 1) Your school principal starts the process by signing and returning a Consent Form to participate. The form can be downloaded from the project website below: <http://www.science-ercise.edu.au/our-project.html>
- 2) The project staff order eWorksheets (for Excel & Numbers) for the school. They can be used on the teacher's and student's computers and iPads.
- 3) Your school will nominate a teacher to attend half a day of training.
- 4) After the training, teachers conduct six lessons using the supplied eWorksheets with final year primary students.
- 5) The participating students will be asked to sit an achievement test at the end and complete an online survey.

