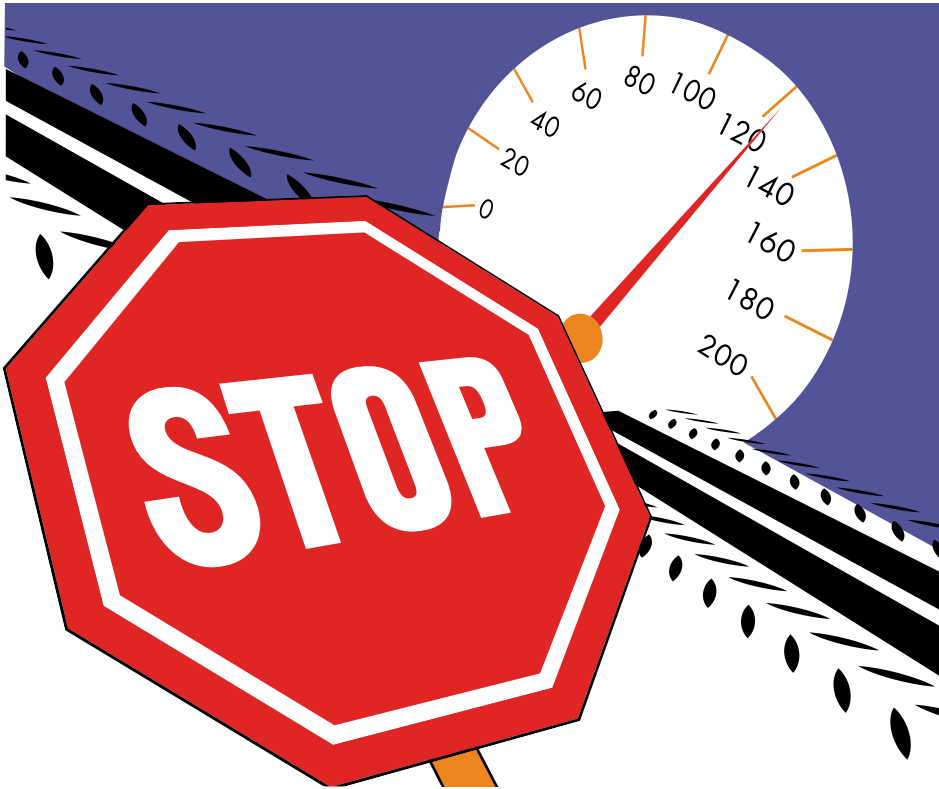


# STOP IN TIME



Explores the theme of speed and stopping distances.

**Year 10**

**Subject**

Physical Science

**Covers**

SU, SHE & SIS requirements of the Australian curriculum

[in2science.org.au](http://in2science.org.au)

## Meet a Mentor

### **Nic is studying Aerospace Engineering at RMIT University**

What are you aiming to do when you finish your course?

I want to go to Europe where there is an active and large aerospace industry and work on propulsion systems for spacecraft – designing components for jet engines and rockets and working at the forefront of technology would be great.

What are some of the things you like about uni?

The university environment is fantastic. I've always liked learning new things and love the attitude that everyone else has to learning as well. It makes uni an exciting place to be.

Why did you get involved with In2science?

I liked the idea of helping young people learn science and thought that involving uni students in helping them consider science as a career option was a great idea...

I thought I could help out and just wanted to be involved.

What advice would you give to other mentors about to start a placement?

Don't worry – just jump straight in and do it – it's a lot of fun!



## Curriculum Links

### SHE – Use and influence of science

People can use scientific knowledge to evaluate whether they should accept claims, explanations or predictions. (ACSH194)

### SIS – Planning and conducting

Plan, select and use appropriate investigation methods, including field work and laboratory experimentation, to collect reliable data; assess risk and address ethical issues associated with these methods. (ACSI199)

Select and use appropriate equipment, including digital technologies, to systematically and accurately collect and record data. (ACSI200)

### SIS – Evaluating

Critically analyse the validity of information in secondary sources and evaluate the approaches used to solve problems. (ACSI206)

- Judging the validity of science-related media reports and how these reports might be interpreted by the public
- Describing how scientific arguments, as well as ethical, economic and social arguments, are used to make decisions regarding personal and community issues

## Further resources

[www.latrobe.edu.au/in2science/resources](http://www.latrobe.edu.au/in2science/resources)

[australiancurriculum.edu.au/Science/Curriculum/F-10](http://australiancurriculum.edu.au/Science/Curriculum/F-10)

## Possible Experiments

### Surface

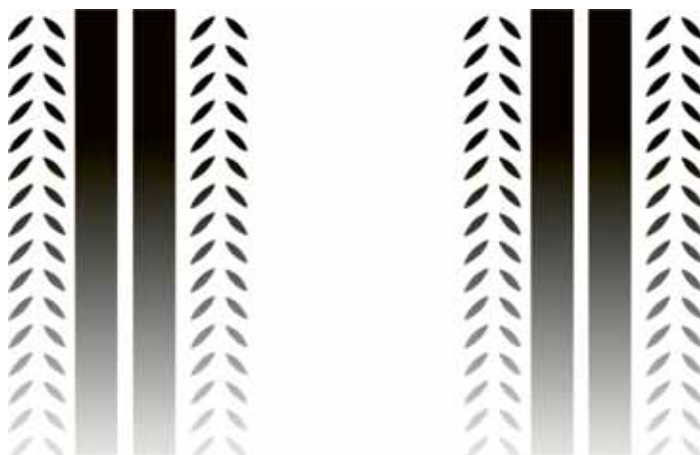
Investigate how stopping distances vary on different surfaces (eg: dry, icy, wet, oily, gravel).

### Braking distance

Mark a bike wheel in one place so the revolutions can be counted. Test braking time and distance when brakes dry, wet, oily.

### Speed

Investigate how speed links to stopping distances (eg: toy car and a ramp of increasing gradient). Could use light gates and data-loggers.



# Lesson Idea

## Aim

To investigate factors affecting stopping distance.

## Lesson Outline

- Watch TAC Vic advert, pick out facts (eg: speeds involved, how do they calculate speed?) [youtube.com/watch?feature=endscreen&v=5Z23CzSONiU&NR=1](https://www.youtube.com/watch?feature=endscreen&v=5Z23CzSONiU&NR=1)
- Plan, carry out and evaluate experiment into stopping distance
- Calculate speed limits in km/h and m/s. Compare experimental results to legal speed limits. *Numeracy*
- Investigate different viewpoints about speed limits/cameras. *Literacy*
- Discuss other factors that can affect stopping distance (eg: thinking time increased by music, alcohol etc) *Ethical Behaviour*
- Create poster/advert/leaflet warning of dangers of speeding. *Critical & creative thinking*

## Mentor Support

How your In2science mentor can assist.

### Whole class

- Answer questions about science careers (Did you know policemen use science? Can you think of a job that doesn't use science?)

### Small Groups

- Measure reaction times using rulers [hometrainingtools.com/measure-reaction-time-science-project/a/1836](http://hometrainingtools.com/measure-reaction-time-science-project/a/1836) or
- [humanbenchmark.com/tests/reactiontime](http://humanbenchmark.com/tests/reactiontime) (online testing)

## Curriculum Links

### Physical Science Year 10

The motion of objects can be described and predicted using the laws of physics. (ACSSU229)

- Gathering data to analyse everyday motions produced by forces, such as measurements of distance and time, speed, force, mass and acceleration

### One-on-one

- Help individuals plan and carry out experiments