# Ecomath – Reducing car use

**ABC Me screening details: Monday** 18 May, 2020 – 11:45am

**Key learning areas: Maths, Science**

**About:** In this episode, Stefan explores alternatives to car use by pedaling a rickshaw across Bristol and performing simple calculations to determine the carbon cost of a new cycle way.

## Before the episode

1. How many cars do you own?
2. How many days a week do you use your cars?
3. Estimate how many kilometres a week your cars would drive.

## During the episode

1. Why do we prefer cars as a means of travel?
2. How many kilograms of CO2 is saved by a person riding as opposed to driving 1 km?
3. How many kilograms of CO2 were produced by building 1 km of cycling track?

This episode can also be viewed on [ABC iView](https://iview.abc.net.au/show/ecomaths) after the scheduled screening time.

## After the episode

1. Think of friends and people you know. Record in the frequency table below how each person gets to school.
2. Calculate the fraction and percentage of people that travel by each mode of transport.
3. Cars and light vehicles account for 10% of Australia’s greenhouse gas emissions. If Australia produces 43 000 000 tonnes of CO2 each year, how much is produced by cars and light vehicles?
4. The average emissions for cars in Australia is 45% higher than it is in Europe. Based on your answer to question 3, how much CO2 is produced by cars in Europe?
5. The average car produces 184 g CO2 per kilometre. Based on your kilometre estimate from before the episode, how many kilograms of CO2 would your cars produce in a year?
6. How many kilograms of CO2 could you save by cycling or walking everywhere rather than using a car?

|  |  |  |  |
| --- | --- | --- | --- |
| Mode of transport | Number of people | Fraction | Percentage |
| Car |  |  |  |
| Bus |  |  |  |
| Train |  |  |  |
| Walk |  |  |  |
| Ride |  |  |  |
|  |  |  |  |
|  |  |  |  |
| **Total** |  |  |  |

**Follow-up activity:** Buses only emit 12-22gCO2/km (per person) and trains 3-21gCO2/km (per person). Consider which of your car trips could be replaced by either walking, cycling, bus or train. Work out how many kilograms of CO2 you could save each year by swapping to these modes of transport.

# NSW teacher notes

This is an optional standalone resource that could supplement student learning. The activities align with syllabus outcomes across stages and can be modified to meet the needs of your students. Students can complete the activities while learning at home and in the classroom. All activities can be completed without access to the internet or a device. Teachers could collect student work to offer feedback and as evidence of learning.

## Learning intentions

* To investigate car emissions in Australia
* To calculate with fractions, decimals and percentages in a real life context

## Resources

* calculator

## NSW Mathematics K-10 Syllabus outcomes

|  |  |  |
| --- | --- | --- |
|  | Stage 3 | Stage 4 |
| Working mathematically | describes and represents mathematical situations in a variety of ways using mathematical terminology and some conventions (MA3-1WM)selects and applies appropriate problem-solving strategies including the use of digital technologies, in undertaking investigations (MA3-2WM) | communicates and connects mathematical ideas using appropriate terminology, diagrams and symbols (MA4-1WM)applies appropriate mathematical techniques to solve problems (MA4-2WM) |
| Fractions, Decimals and Percentages | compares, orders and calculates with fractions, decimals and percentages (MA3-7NA) | operates with fractions, decimals and percentages (MA4-5NA) |
| Data | uses appropriate methods to collect data and constructs, interprets and evaluates data displays, including dot plots, line graphs and two-way tables (MA3-18SP) |  |
| Ratio and Rates |  | operates with ratios and rates, and explores their graphical representation (MA4-7NA) |

## NSW Science and Technology K-10 Syllabus outcomes

|  |  |  |
| --- | --- | --- |
|  | Stage 2 | Stage 3 |
| Thing 1 |  |  |
| Thing 2 |  |  |

© 2020 NSW Education Standards Authority (NESA) for and on behalf of the Crown in right of the State of New South Wales. See the [NESA website](https://educationstandards.nsw.edu.au/wps/portal/nesa/mini-footer/copyright) for additional copyright information.

# VIC teacher notes

This is an optional standalone resource that could supplement student learning. The activities align with syllabus outcomes across stages and can be modified to meet the needs of your students. Students can complete the activities while learning at home and in the classroom. All activities can be completed without access to the internet or a device. Teachers could collect student work to offer feedback and as evidence of learning.

## Learning intentions

* Students will
* Students will

## Resources

* scissors
* glue

## NSW Mathematics K-10 Syllabus outcomes

|  |  |  |
| --- | --- | --- |
|  | Stage 2 | Stage 3 |
| Working mathematically | uses appropriate terminology to describe, and symbols to represent, mathematical ideas (MA2-1WM) | describes and represents mathematical situations in a variety of ways using mathematical terminology and some conventions (MA3-1WM) |
| Fractions and decimals | represents, models and compares commonly used fractions and decimals (MA2-7NA) | compares, orders and calculates with fractions, decimals and percentages (MA3-7NA) |

## NSW Science and Technology K-10 Syllabus outcomes

|  |  |  |
| --- | --- | --- |
|  | Stage 2 | Stage 3 |
| Thing 1 |  |  |
| Thing 2 |  |  |

© 2020 NSW Education Standards Authority (NESA) for and on behalf of the Crown in right of the State of New South Wales.