# Sustainable Transport and Scatter Plots Maths Year 11 Student Worksheet

**Name: …………………………………….. Class: …………..**

## Thought starter: What will transport emissions be like in the future?

**1.** View this 2040 clip on Transport.

[2040 – Car of the Future](https://vimeo.com/showcase/6167669/video/336510915) **Password 2040\_EDU** (https://vimeo.com/showcase/6167669/video/336510915)

**While** you’re watching, complete the table below.

|  |  |  |
| --- | --- | --- |
| **SEE** – What did you see as you watched this video? | **HEAR** – What did you hear the narrator talk about in the video? | **WONDER** – What questions arose as you watched? |
|  |  |  |

**2.**Consider all the people in your household. Fill in the table below to indicate how they get to work, school or other duties during the day.

|  |  |  |
| --- | --- | --- |
| Family member (e.g. brother) | Destination (e.g. work, university) | Mode of transport (walk, ride, public transport – what type, car (individual or shared) |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |

**3.** Go to the [Australian Greenhouse Gas Calculator](https://www.epa.vic.gov.au/agc/calculator/index.html) (https://www.epa.vic.gov.au/agc/calculator/index.html).

* Enter the appropriate information about your household on the Tell us about your household page and then click Done.
* On the Transport page, enter information regarding all of the cars in your household. For annual kilometres, select Typical, unless you are clear about low or high use of particular vehicles.
* Click on the Public Transport tab and select the appropriate options from the drop-down menus (you may need to make some educated guesses or use a maps app to help you calculate distances).
* Now look at the top of page. What is the total amount of ‘ghg emissions’ per year, for your household coming from transport?  
    
  \_\_\_\_\_\_\_\_\_\_ tonnes

**4.** Pair up with another student to compare greenhouse emissions figures and complete the following table:

**Column A:** Answer the questions in this column on your own first.  
**Column B:** Talk about the findings and your thoughts with your partner, then add anything in column B that you hadn’t originally thought of.

|  |  |  |
| --- | --- | --- |
|  | **A** | **B** |
| Whose is more? Less? Why? |  |  |
| Write down any ideas that you have about how your household ghg emissions from transport could be reduced. |  |  |

**5. Group Task**

Place the data provided by your teacher in this table:

|  |  |  |
| --- | --- | --- |
| **Year** | **Projected Australian population** | **Emissions from transport MtCO2** |
| 2020 |  |  |
| 2021 |  |  |
| 2022 |  |  |
| 2023 |  |  |
| 2024 |  |  |
| 2025 |  |  |
| 2026 |  |  |
| 2027 |  |  |
| 2028 |  |  |
| 2029 |  |  |
| 2030 |  |  |

Describe the pattern of the scatterplot that your teacher has created:

A.  What is the direction of the relationship between the two variables?

B.  What does this suggest about our growing population and greenhouse gas emissions from transport in the future? Why do you think this is so?

**6. Individual Task**

Using the data tables below construct a scatterplot to display the relationship between Australia’s projected population growth and Australia’s projected emissions from cars, starting from 2020 to 2030.

According to the Australian Bureau of Statistics, Australia’s population numbers from 2020 to 2030 will be:

|  |  |
| --- | --- |
| **Year** | **Projected Australian population** |
| 2020 | 25,936,500 |
| 2021 | 26,402,046 |
| 2022 | 26,873,947 |
| 2023 | 27,349,900 |
| 2024 | 27,829,520 |
| 2025 | 28,311,405 |
| 2026 | 28,796,151 |
| 2027 | 29,283,507 |
| 2028 | 29,773,492 |
| 2029 | 30,264,147 |
| 2030 | 30,755,046 |

Source:  
<https://www.abs.gov.au/ausstats/abs@.nsf/latestProducts/3222.0Media%20Release12017%20(base)%20-%202066>

And according to the Australian Department of Energy and the Environment, greenhouse gas emissions from all Transport from 2020 to 2030 will be:

|  |  |
| --- | --- |
| **Year** | **Emissions from cars MtCO2** |
| 2020 | 45 |
| 2021 | 45 |
| 2022 | 45 |
| 2023 | 45 |
| 2024 | 46 |
| 2025 | 46 |
| 2026 | 45 |
| 2027 | 45 |
| 2028 | 45 |
| 2029 | 44 |
| 2030 | 44 |

Put the above data into the same table:

|  |  |  |
| --- | --- | --- |
| **Year** | **Projected Australian population** | **Emissions from cars MtCO2** |
| 2020 |  |  |
| 2021 |  |  |
| 2022 |  |  |
| 2023 |  |  |
| 2024 |  |  |
| 2025 |  |  |
| 2026 |  |  |
| 2027 |  |  |
| 2028 |  |  |
| 2029 |  |  |
| 2030 |  |  |

Construct your axes, labelling it with regular and equal intervals as appropriate to the data. Make sure you tell us what each axes is telling us – which one is about population and which one is emissions? What is the measurement used on each axis?

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |

* Insert the data using coloured dots.
* Draw in a line of best fit in another colour.

**7. Analyse the scatterplot and draw conclusions**

**Column A:** Answer the questions in this column on your own first.  
**Column B:** Talk about the findings and your thoughts with a partner, then add anything in column B that you hadn’t originally thought of.

|  |  |  |
| --- | --- | --- |
|  | **A** | **B** |
| Describe the scatterplot by looking for patterns. What do you see? |  |  |
| What does this suggest about our growing population and greenhouse gas emissions from cars in the future? Why do you think that this is so? [Think back to the video about the future of transport] |  |  |
| Compare the two scatterplots that you have created and discuss what you observe between population numbers and car emissions only versus emissions from all forms of transport. |  |  |

**8. Take Action**

Conduct some more research on climate change and transport using the following websites and then make a poster that presents how transport of the future can be more efficient and which aims to persuade others to consider how their decision-making around transport can impact on the planet. Remember to include some of the information that you have learned today about population growth and emissions.

* <https://www.climatecouncil.org.au/resources/transport-climate-change/>
* <https://www.drawdown.org/solutions/transport/electric-vehicles>
* <https://www.drawdown.org/solutions/transport/cars>
* <https://www.greenvehicleguide.gov.au/>

**9. Reflection**

I used to think…

But now I think…