

Jet engines burn kerosene, and cars burn gasoline. This creates carbon dioxide and soot as a by-products. Both of these are known to have an impact on global warming.

The amount of carbon dioxide produced depends on the length of the trip. It is common to use 'passenger mile' as a measure of traveled distance. This is then the average amount of carbon dioxide that a single person generates in the jet or car for each mile of the journey.

The table below gives the average amount  $M$  of carbon dioxide (produced in kilograms) for  $D$  the indicated number of passenger miles taken.

D	300	600	900	1200	1500
M	44	86	128	170	212

**Problem 1** – Graph the data in this table with passenger miles ( $D$ ) on the horizontal axis and the total carbon dioxide produced in kilograms ( $M$ ) on the vertical axis. Graph the data from  $D = 0$  to 1600 miles and  $M = 0$  to 250 kilograms. What is the rate of change for the data in the graph? What is the linear equation that describes this data?

The following table shows the carbon dioxide produced in kilograms ( $M$ ) by an average family car that has a fuel efficiency of 21 mpg and traveling  $D$  passenger miles.

D	300	600	900	1200	1500
M	76	151	226	301	376

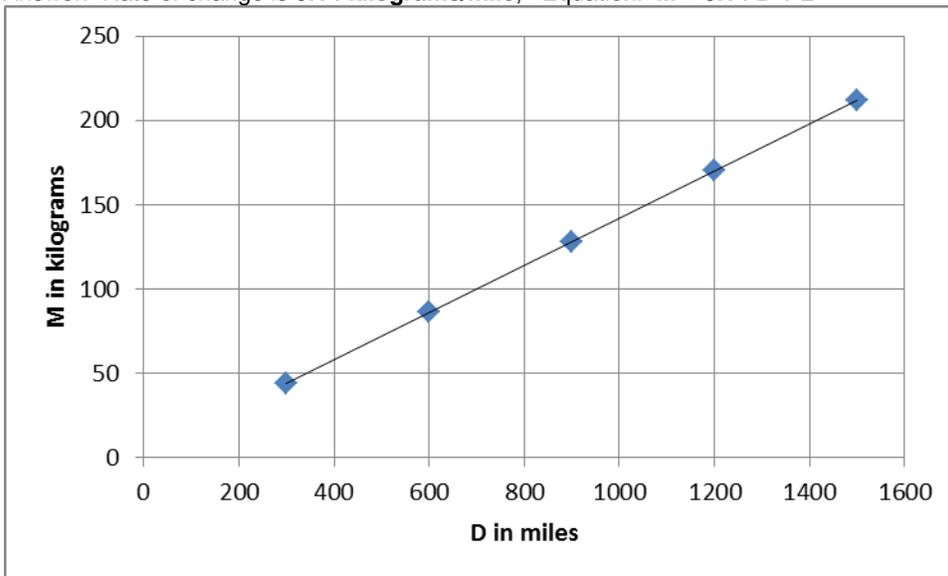
**Problem 2** - Graph the data from  $D = 0$  to 1600 miles and  $M = 0$  to 400 kilograms. What is the rate of change for the data in the graph? What is the linear equation that describes this data?

**Problem 3** – If someone wanted to travel 2,000 miles to visit a relative, which mode of travel would produce the least carbon dioxide?

# Answer Key

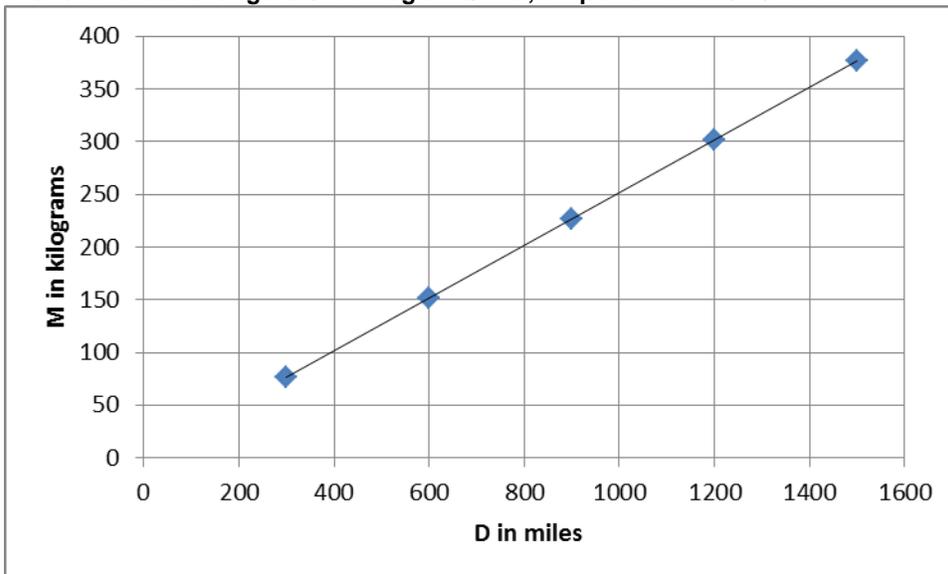
**Problem 1** – Graph the data in this table with D the miles flown on the horizontal axis and M the total carbon dioxide produced in kilograms on the vertical axis. Graph the data from D = 0 to 1600 miles and M = 0 to 250 kilograms. What is the rate of change for the data in the graph? What is the linear equation that describes this data?

Answer: Rate of change is **0.14 kilograms/mile**; Equation:  **$M = 0.14 D + 2$**



**Problem 2** - Graph the data from D = 0 to 1500 miles and M = 0 to 400 kilograms. What is the rate of change for the data in the graph? What is the linear equation that describes this data?

Answer: **Rate of change is 0.14 kilograms/mile**; **Equation:  $M = 0.25 D + 2$**



**Problem 3** – If someone wanted to travel 2,000 miles to visit a relative, which mode of travel would produce the least carbon dioxide?

Answer: Car:  $D = 2000$ , so  $M = 0.25 (2000) + 1 = 501$  kilograms.

Jet:  $M = 0.14(2000) + 2 = 282$  kilograms.

**Air travel produces the least carbon dioxide for long trips.**