

## Making Predictions

- Regression line can be used to predict outcomes

EG. In an investigation of the relationship between the food energy content and the fat content in a standard sized packet of chips, the regression line was found to be:

$$\text{Energy content} = 27.8 + 14.7 \times \text{Fat content}$$

Use the regression equation to predict the energy content of a packet of chips with a fat content of 8g

$$\begin{aligned}\text{Energy} &= 27.8 + 14.7 \times 8\text{g} \\ &= 145.4 \text{ kJ}\end{aligned}$$

## **Interpolation and Extrapolation**

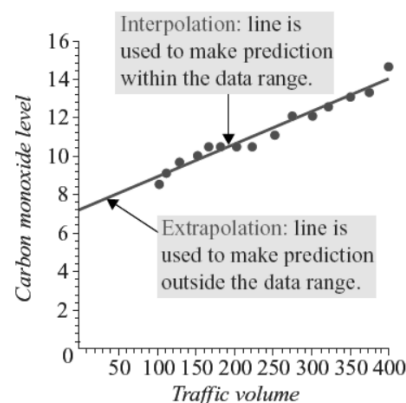
- Regression line only applies to the range of data used to calculate the equation

Interpolation - making a prediction within the data range. These predictions are relatively safe

Extrapolation - making predictions outside of the data range. These predictions are less reliable

EG. Predicting the carbon monoxide level for a traffic volume of 200 cars per hour would be interpolating

Predicting the carbon monoxide level for a traffic volume of 50 cars per hour would be extrapolating



EG. It is found that the relationship between the number of people playing a casino Jackpot game and the prize money offered is given by the equation  $N = 0.07p + 220$ , where  $N$  is the number of people playing and  $p$  is the prize money.

a. Find the number of people playing when the prize money is \$2500

↳  $p$  value

$$N = 0.07(2500) + 220$$
$$= 395 \text{ people}$$

b. Find the likely prize on offer if there were 500 people playing.

↳  $N$  value

$$-220 \quad 500 = 0.07p + 220$$

$$\frac{280}{0.07} = \frac{0.07p}{0.07} \quad p = \$4000$$