

5 – Using Graphs to Estimate Values

Focus: Use interpolation and extrapolation to estimate values on a graph.

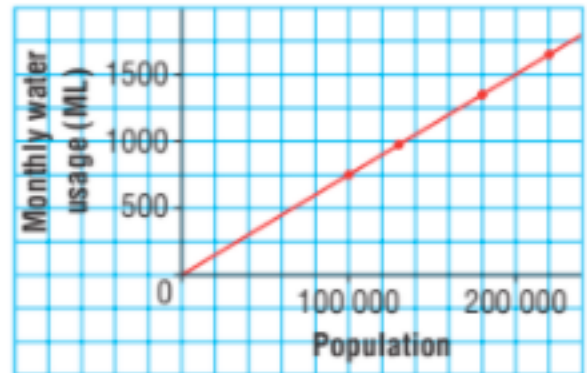
Investigate:

A city has grown over the past few years. This table and graph show how the volume of water used each month is related to the population.

Population	Monthly Water Usage (ML)
100 000	750
130 000	975
180 000	1350
220 000	1650

1 ML is 1 000 000 L

Water Usage in One City



Use these data to:

- Estimate the monthly water usage for a population of 150 000 people.
- Estimate the population when the monthly water usage is 1400 ML.
- Predict the water usage for 250 000 people.

Warmup:

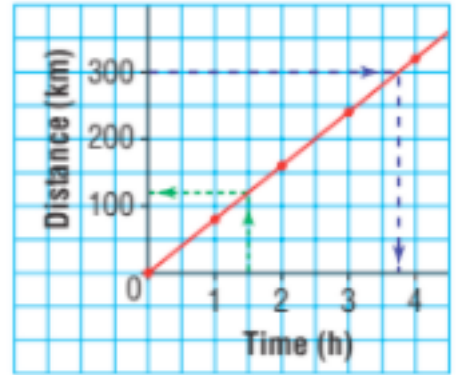
Do the 'Investigate'.

What is interpolation?

When did you use interpolation in the Investigate?

What is extrapolation
When did you use extrapolation in the investigate

Graph of a Car Journey

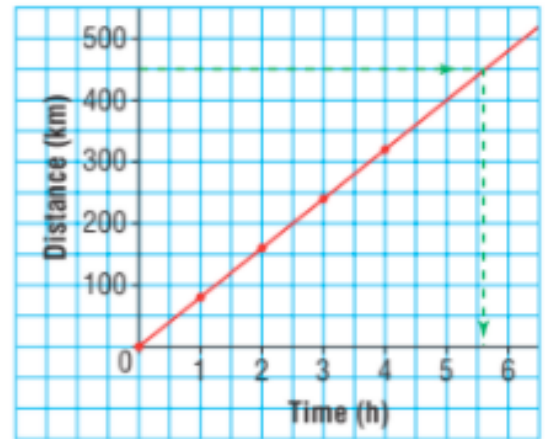


To estimate the time it takes to travel 450 km:

- Extend the grid so the *Distance* axis shows at least 450 km.
Use a ruler to extend the graph.
- Repeat the process to estimate the time to travel 450 km.

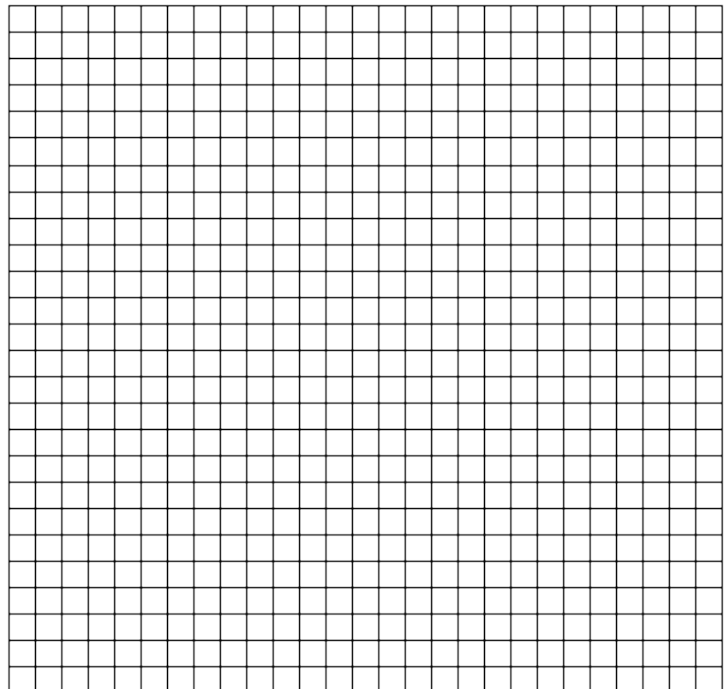
It takes a little more than 5.5 h,
or about 5 h 40 min to travel 450 km.

Graph of a Car Journey



Look at the graphs
Above to better understand
extrapolation.

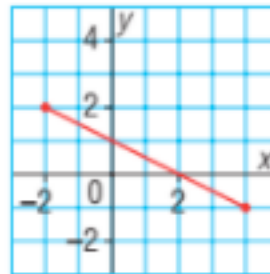
- Ex1
Corey goes biking.
Every 3 minutes (x),
Corey travels 1.5km (y).
a) Draw a graph for the
first 12 minutes of
biking, but leave room
at the end of the graph.
b) How far has Corey



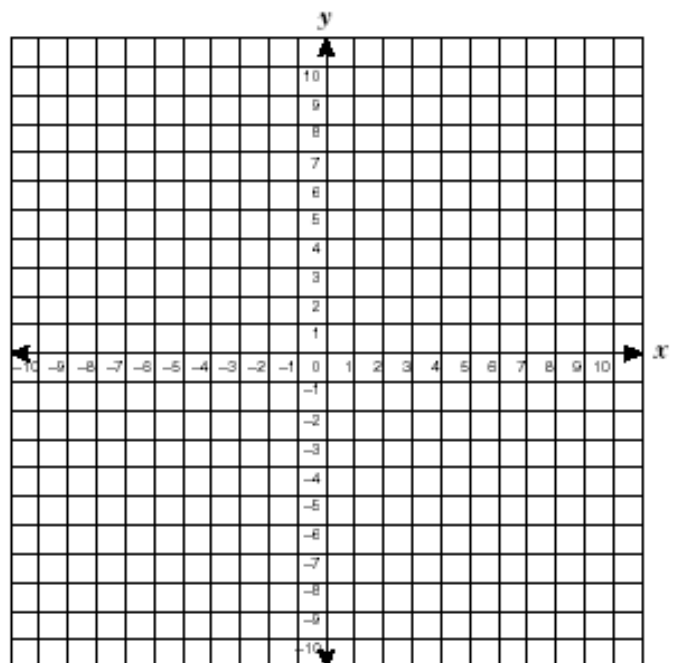
biked after 7 minutes?
 Is this interpolation or extrapolation?
 c) How far will Corey have biked after 17 minutes. Extend your graph to 18 minutes to assist you. Is this interpolation or extrapolation?

Ex 2- Do the following question by first re-drawing and extending the graph. Do part a (i) & (iii) and part b (i) & (iii)

This graph represents a linear relation.



- a) Determine each value of x for:
 i) $y = 6$ ii) $y = -4$ iii) $y = -8$
- b) Determine each value of y for:
 i) $x = -6$ ii) $x = 6$ iii) $x = 9$



Reflection: Give one real life example of extrapolation that could have a significant impact on our world.