

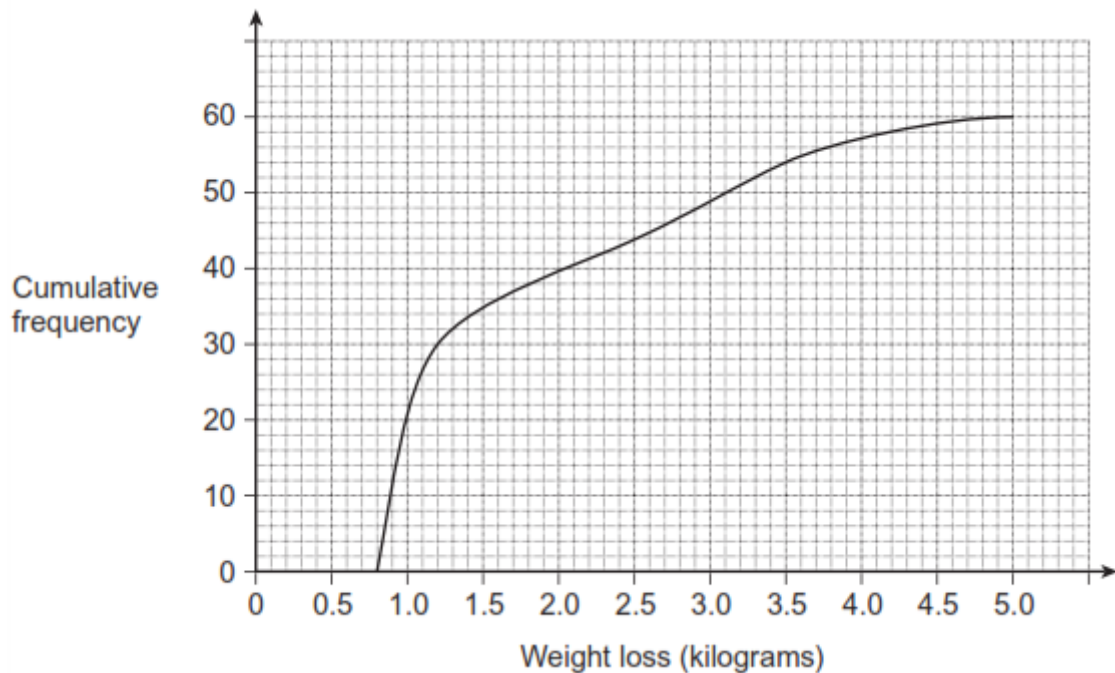
**Problem of the Week: Week 3 (Sum2): Year 10: Statistics: Averages, charts and calculations**
**Solutions:**

- interpret and construct tables and line graphs for time series data
- {construct and interpret diagrams for grouped discrete data and continuous data, i.e. histograms with equal and unequal class intervals and cumulative frequency graphs, and know their appropriate use}

**Join the Gym**

Two groups of people are trying to lose weight.

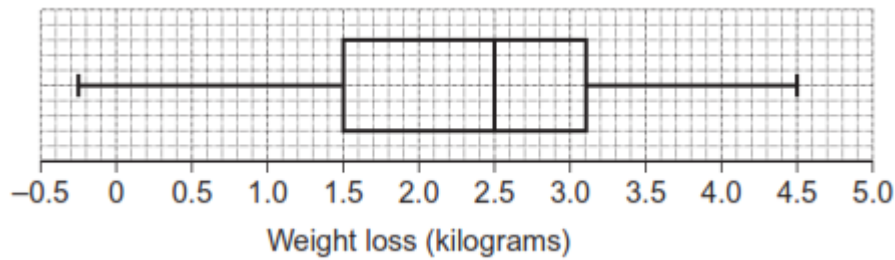
- (a) Group A join a gym.  
The graph shows information about their weight loss after one month.



- (i) How many people are in group A? **There are 60 people**
- (ii) Does everyone in group A lose weight?  
Write down how you decide. **Yes, least weight loss is 0.8 (kg)**  
(Because graph starts after zero)

- (b) Group B follow a diet.

The box plot shows information about their weight loss after one month.



Does everyone in group B lose weight?  
Write down how you decide.

**No, minimum was a negative weight loss (= weight gain)**

- (c) Compare the weight loss of group A with group B.

The interquartile ranges are:

*Group A 1.6*

*Group B 1.6*

*Spread (of weight loss) is the same*

The medians are:

*Group A between 1.15 and 1.25*

*Group B 2.5*

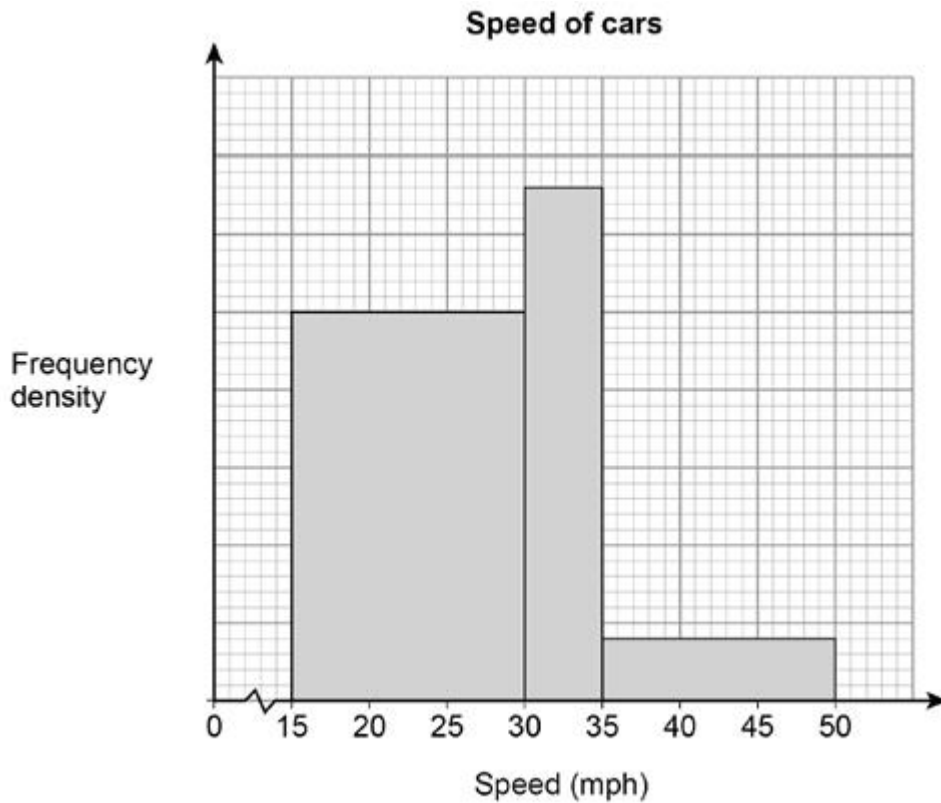
*Group B have a higher average*

*All lost weight in group A but not B*

## Speeding Cars

The histogram shows information about the speed of cars as they pass a checkpoint.

The scale on the frequency density axis is missing.



The histogram shows information about 480 cars.

(a) How many cars does the first bar represent?

### Solution

Counting squares

15 (cm squares) in the first bar

24 (cm squares) in all the bars in total = 480 cars

$$15/24 \times 480 = 300$$

**300 cars in the first bar**

- (b) Cars with a speed greater than 40 mph are over the speed limit.

Use the histogram to estimate the number of cars that are over the speed limit.

**Solution**

Total bar is 2.4 cm squares (35mph – 50 mph)

Height of each cm square is 4 (frequency density axis – use first block in (a) to work this out)

Height of each block of 10mph (the fd) =  $4 \times 0.8$

Width of each block of 10mph = 10

Area of each block = fd x width =  $10 \times 4 \times 0.8 = 32$

**There are 32 cars with a speed greater than 40mph (estimate)**