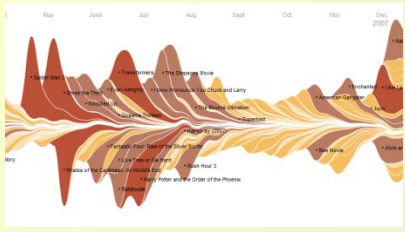
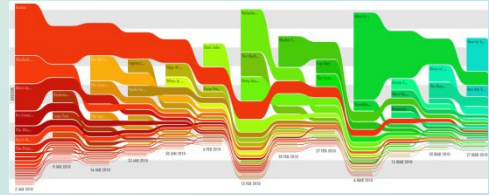


Histograms

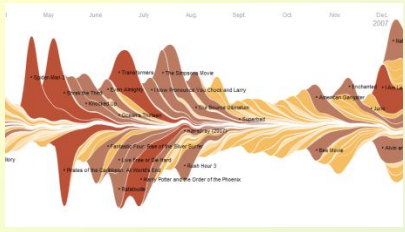


Starter

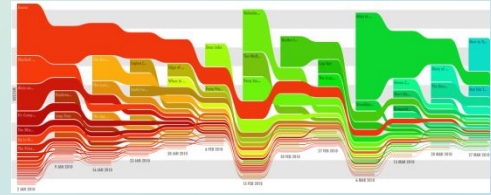


- In the back of your book, draw a **Bar Chart** to show the following information;

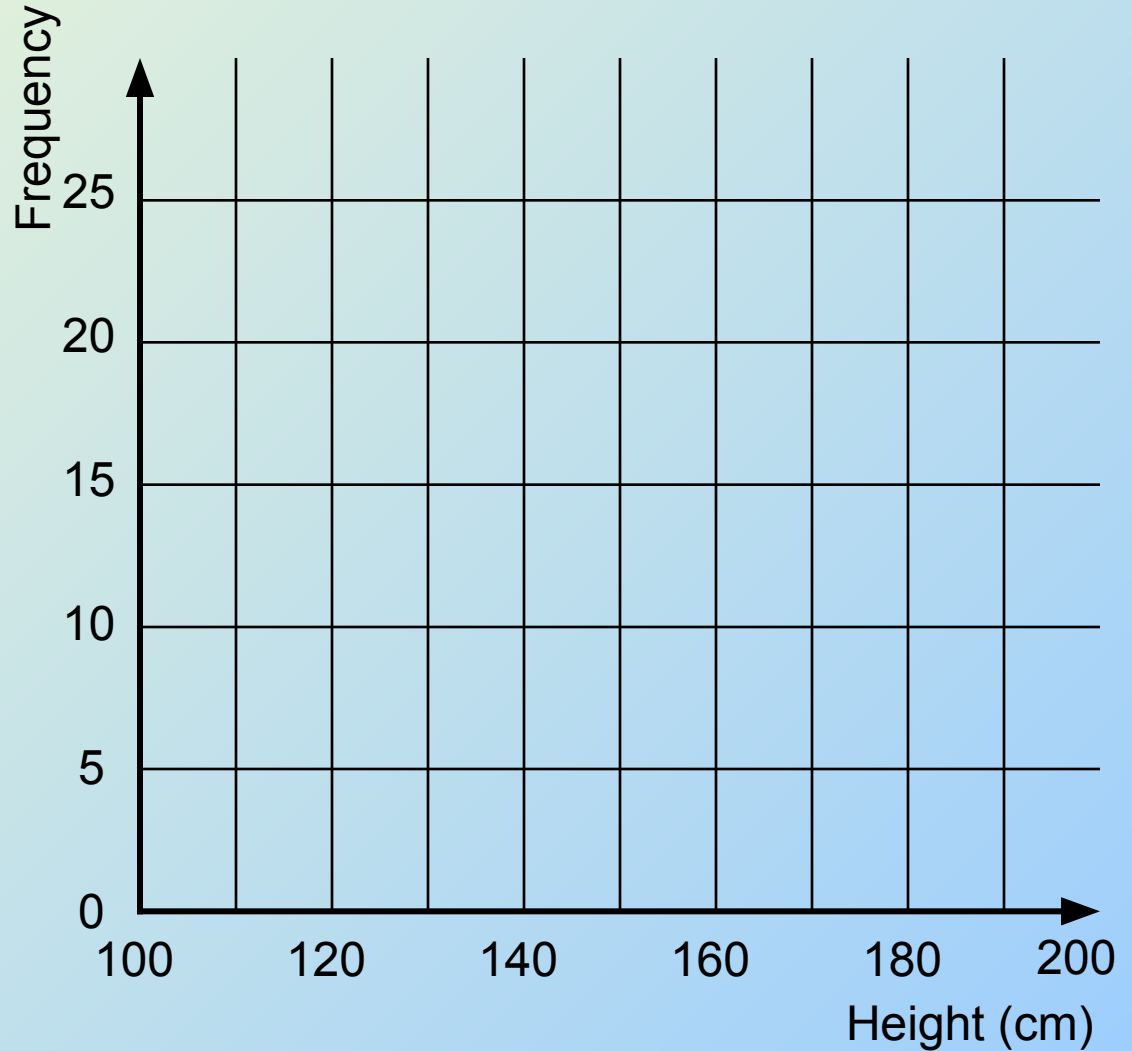
Height (cm)	Frequency
$100 < x \leq 120$	20
$120 < x \leq 140$	25
$140 < x \leq 150$	30
$150 < x \leq 160$	25
$160 < x \leq 200$	20

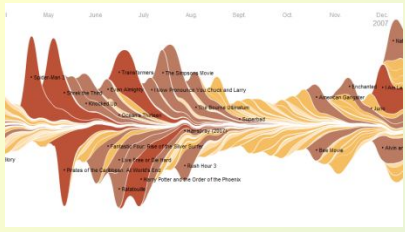


Starter

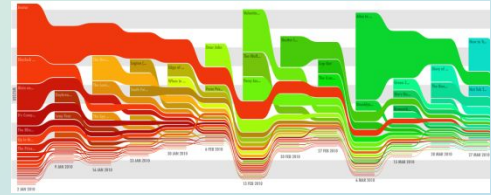


Height (cm)	Frequency
$100 < x \leq 120$	20
$120 < x \leq 140$	25
$140 < x \leq 150$	30
$150 < x \leq 160$	25
$160 < x \leq 200$	20





Starter

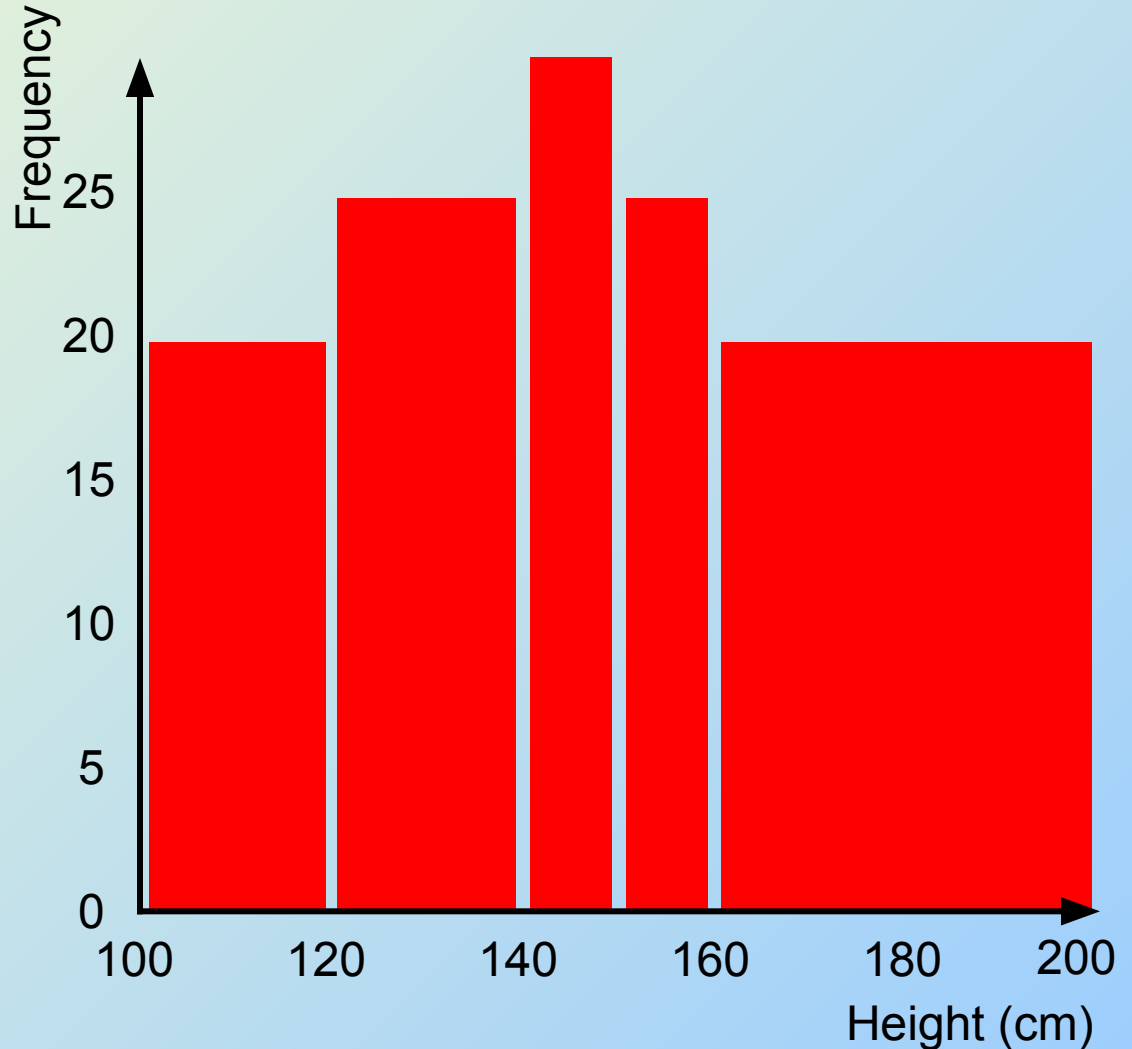


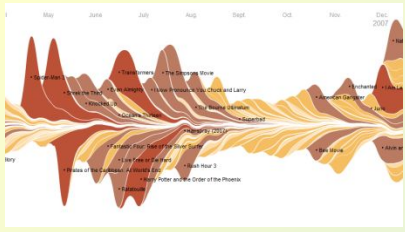
- Problems

1) The data is continuous so there should be no gaps

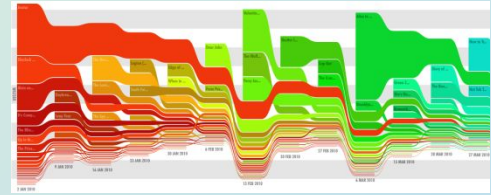
2) 150 - 160 has the same height as 120 - 140, even though it represents a smaller range

A **Histogram** will correct both of these problems!





Histograms

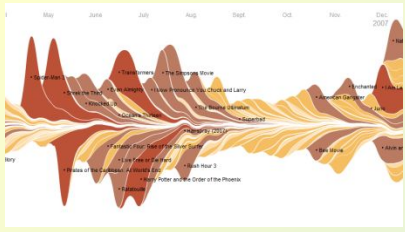


Height (cm)	Frequency	Frequency Density
$100 < x \leq 120$	20	1
$120 < x \leq 140$	25	1.25
$140 < x \leq 150$	30	3
$150 < x \leq 160$	25	2.5
$160 < x \leq 200$	20	0.5

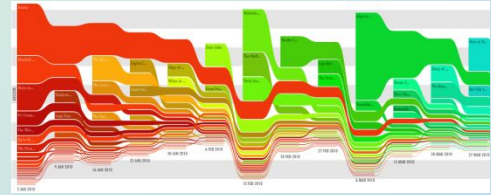
To take into account the size of the group, we calculate 'Frequency Density'

$$\text{Frequency Density} = \frac{\text{Frequency}}{\text{Classwidth}}$$

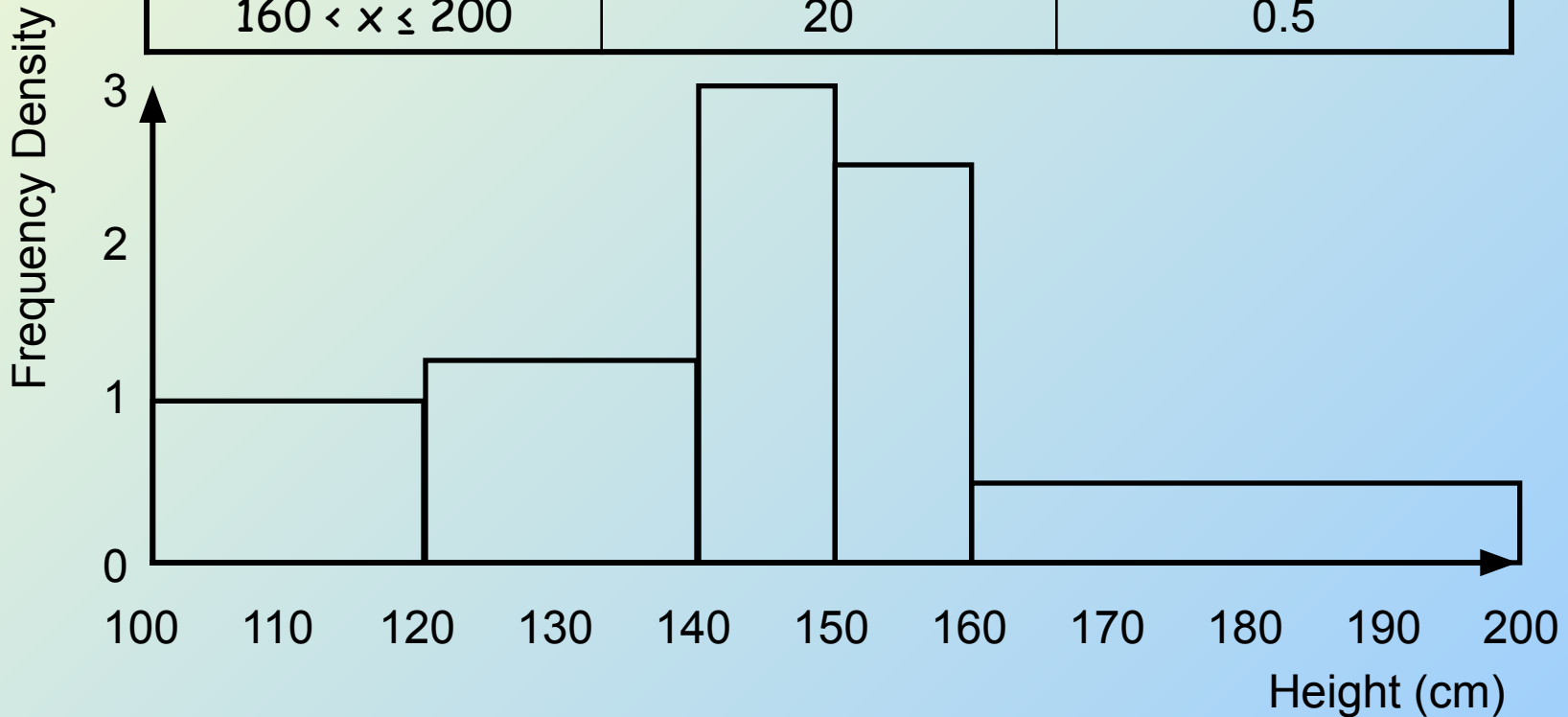
$$\begin{aligned} \text{Frequency Density} &= \frac{25}{20} \\ &= 1.25 \end{aligned}$$

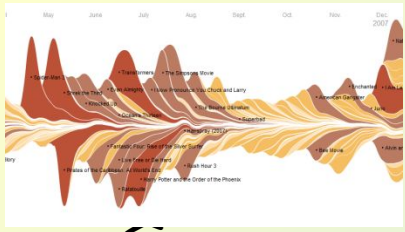


Histograms

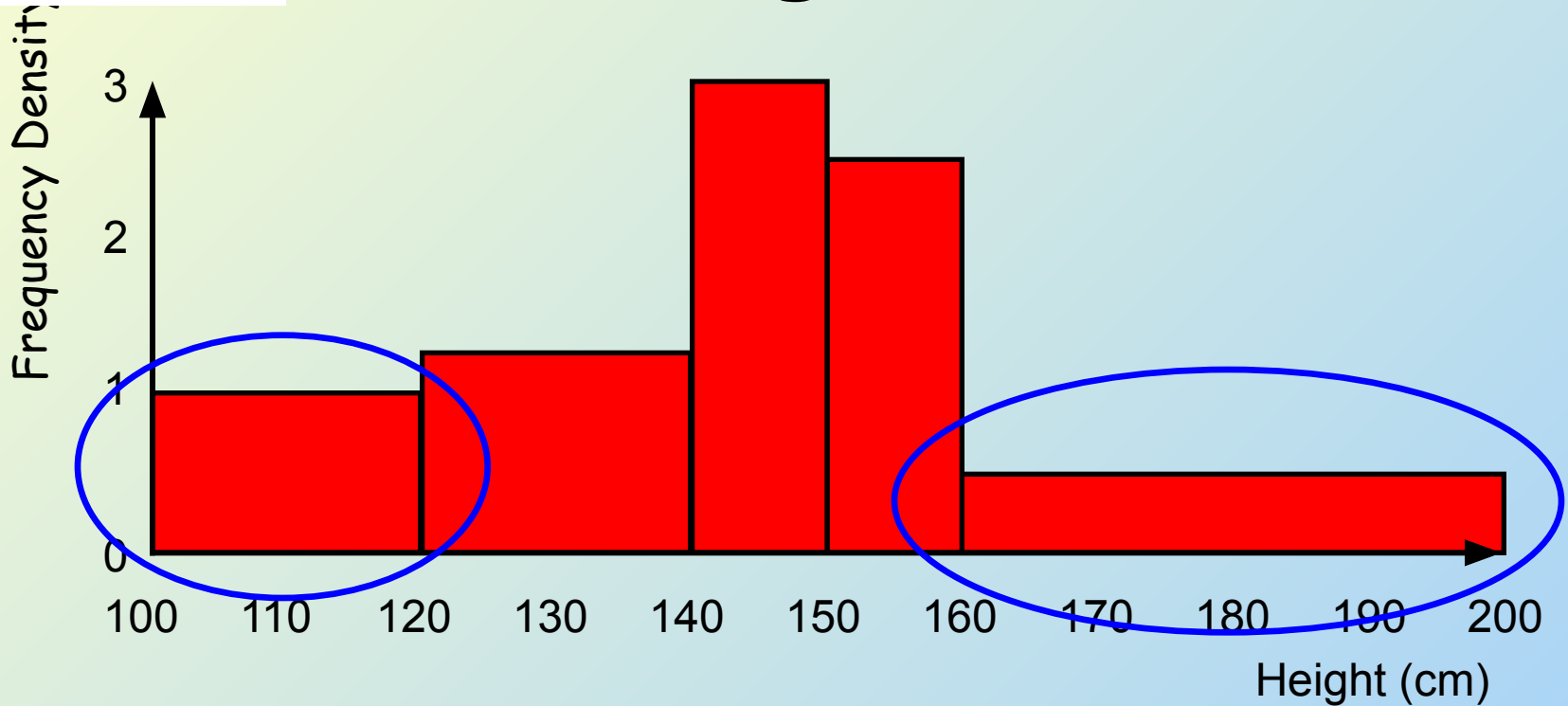
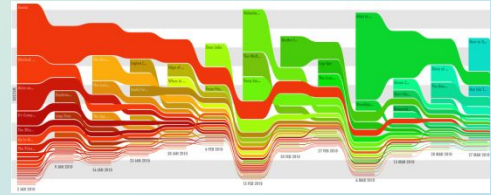


Height (cm)	Frequency	Frequency Density
$100 < x \leq 120$	20	1
$120 < x \leq 140$	25	1.25
$140 < x \leq 150$	30	3
$150 < x \leq 160$	25	2.5
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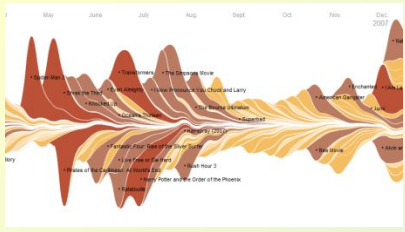


Histograms

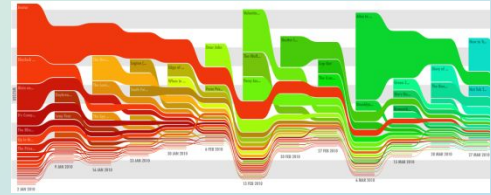


With a **Histogram**, area represents Frequency, not the height

eg) The first group is a rectangle measuring 20 by 1.5
 $20 \times 1.5 = 30$ so there were 30 people in the group



Histograms

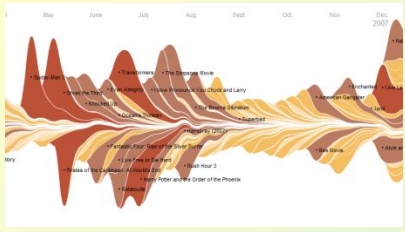


Speed (mph)	Frequency	Frequency Density
$0 < x \leq 40$	10	0.25
$40 < x \leq 50$	15	1.5
$50 < x \leq 60$	18	1.8
$60 < x \leq 65$	20	4
$65 < x \leq 70$	35	7
$70 < x \leq 80$	20	2

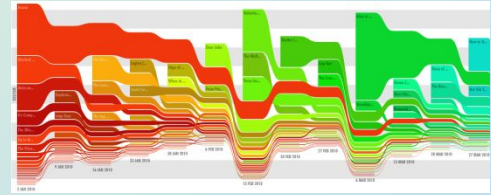
To take into account the size of the group, we calculate 'Frequency Density'

$$\text{Frequency Density} = \frac{\text{Frequency}}{\text{Classwidth}}$$

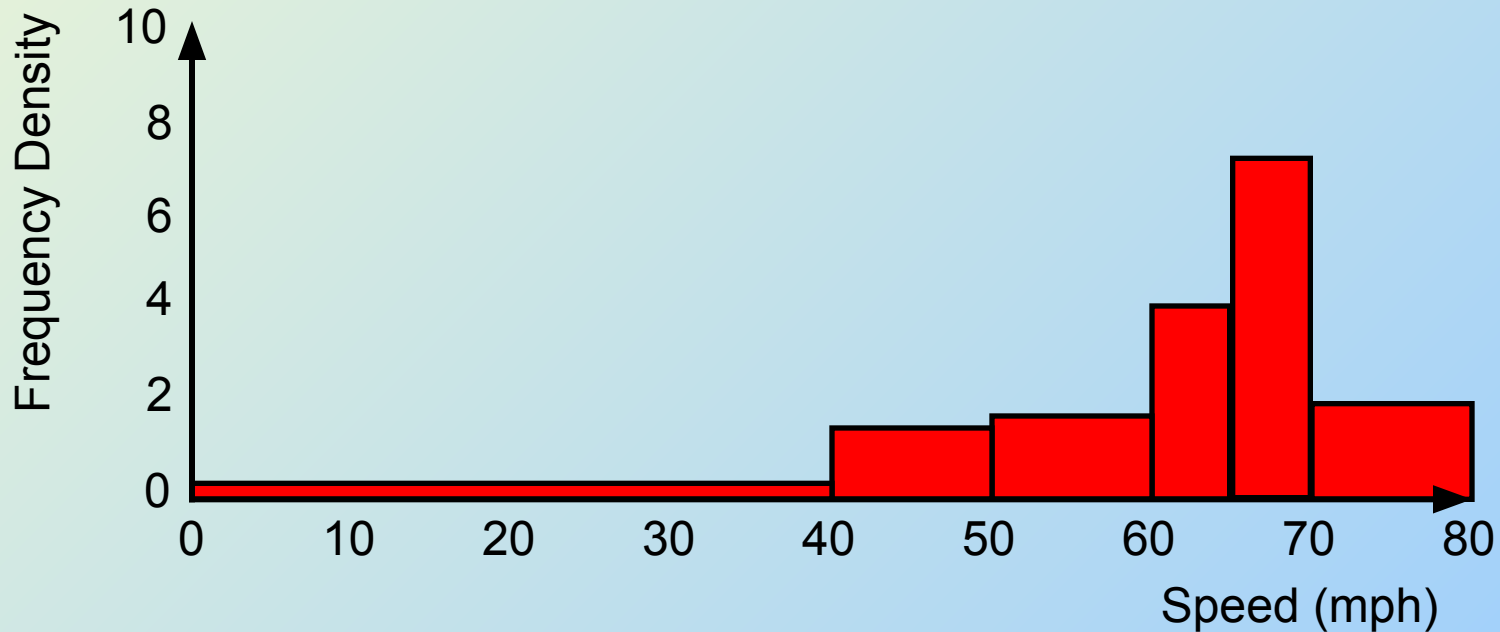
$$\text{Frequency Density} = \frac{20}{40} = 0.5$$

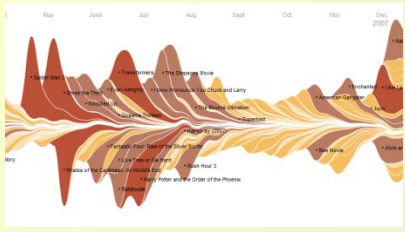


Histograms

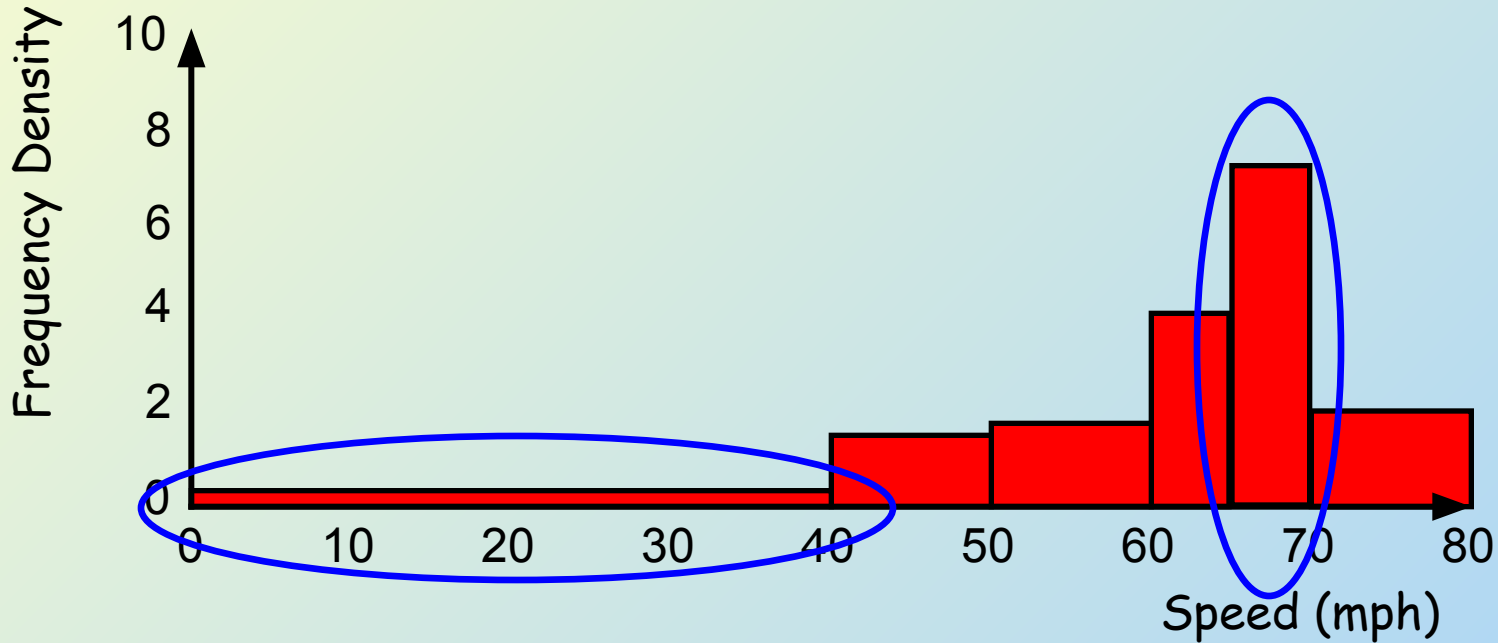
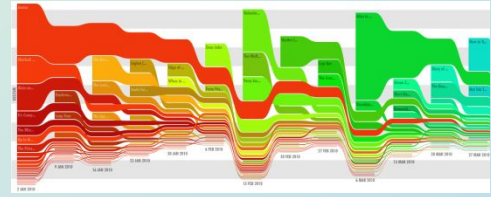


Speed (mph)	Frequency	Frequency Density
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$50 < x \leq 60$	18	1.8
$60 < x \leq 65$	20	4
$65 < x \leq 70$	35	7
$70 < x \leq 80$	20	2





Histograms

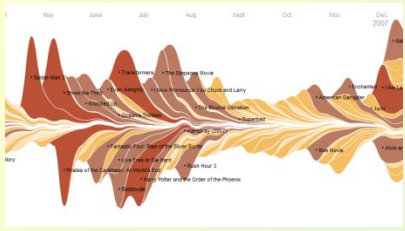


Remember that Area represents Frequency!

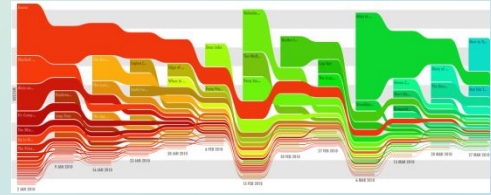
Group 5 is a 40 by 70.25 rectangle

$$40 \times 70.25 = 10$$

So 10 people in the group



Plenary



10 (a) The table shows information about the size of eggs and percentages of eggs sold in a supermarket in the UK.

Classification of Eggs UK			
Size	Minimum weight	Maximum weight	Percentage of sales
Small	33g	53 g	10
Medium	53 g	63 g	22
Large	63 g	73 g	53
Extra Large	73 g	103g	15

Frequency
Density

0.5

2.2

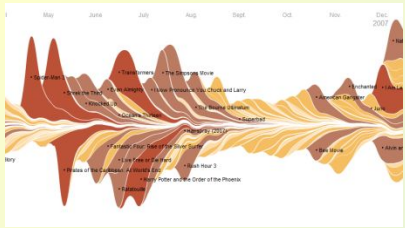
5.3

0.5

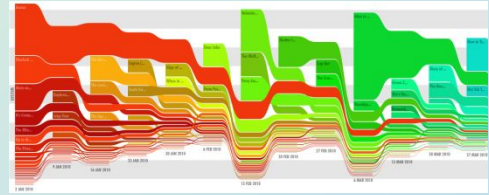
You may assume no eggs are less than 33 g or more than 103 g.

Draw a fully labelled histogram to show the data.

(4)

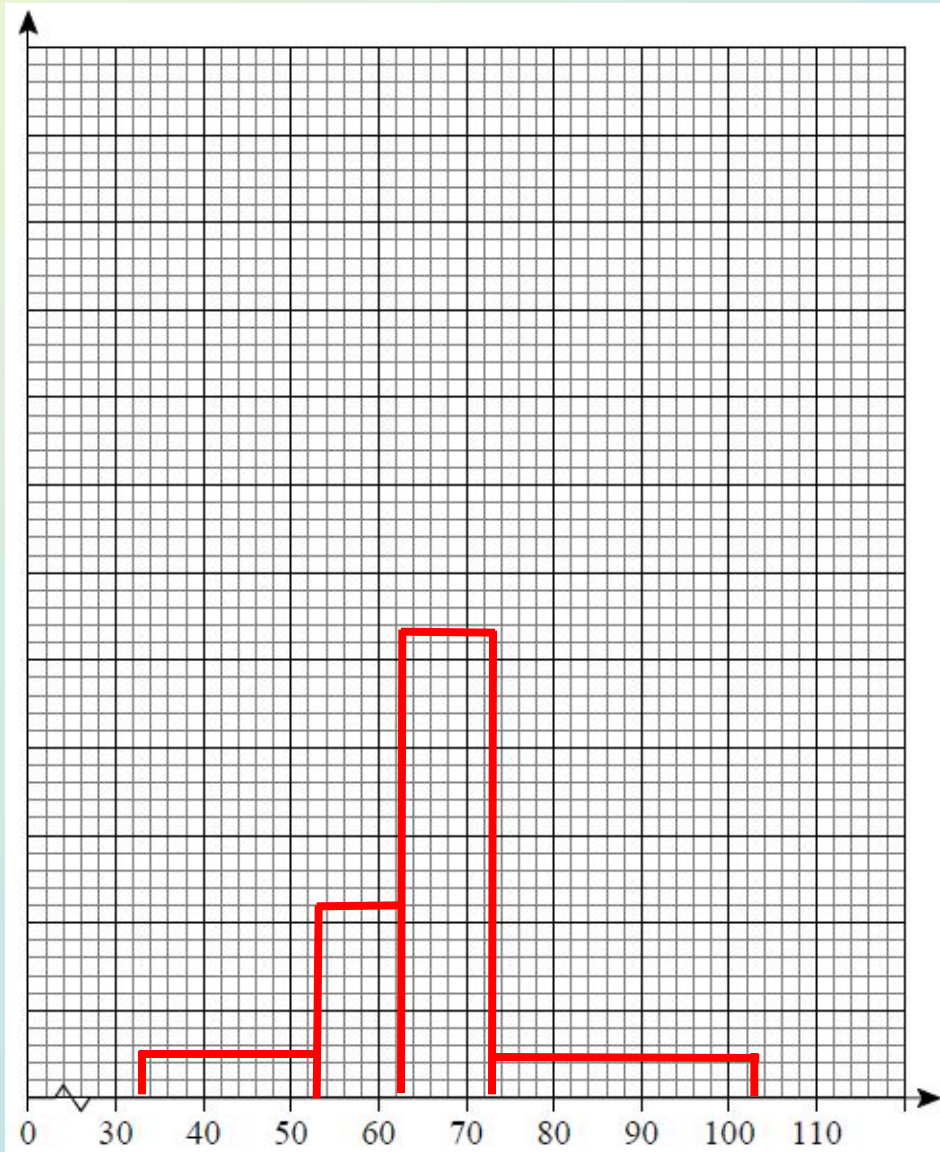


Plenary

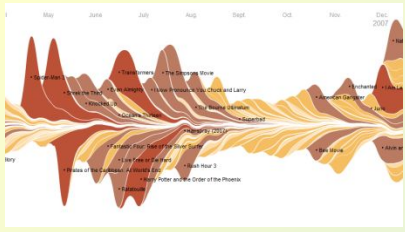


Frequency Density

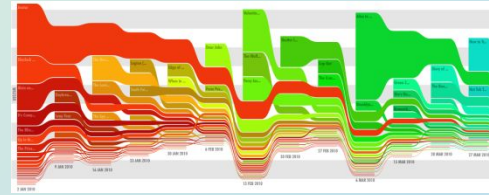
6
5
4
3
2
1



Egg Weight (g)



Summary



- We have learnt how to plot **Histograms** of sets of data
- We have seen how they are different to **Bar Charts**
- We have learnt what is meant by '**Frequency Density**'
- We have shown that on a **Histogram**, area represents **Frequency**, not height!