



Find 5 numbers with a mean of 8.



Four numbers have a mean of 6.

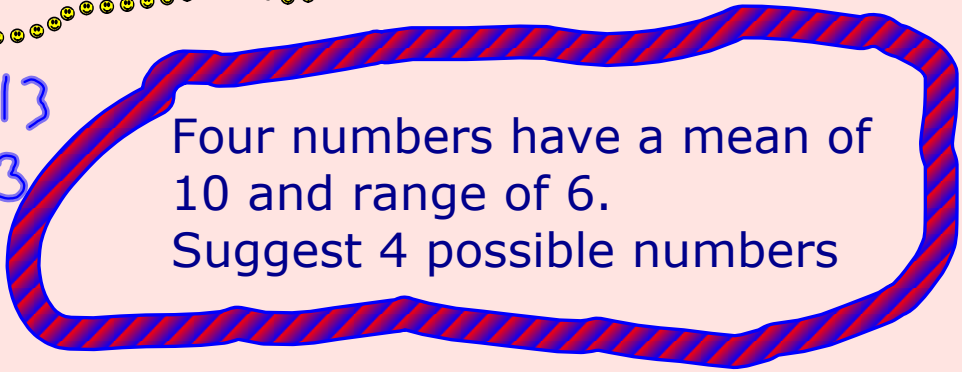
Three of them are 2,5,6.

What is the 4th?

7, 9, 11, 13

7, 8, 12, 13

8, 9, 9, 14



Four numbers have a mean of 10 and range of 6.  
Suggest 4 possible numbers

If you were going to draw a graph of data, would you group it or not in the following cases:

**weights of children**

$1 \leq w < 2$   
 $2 \leq w < 3$   
 $3 \leq w < 4$

**number of CDs owned by students in 10M1**

~~0-5~~  
6-10  
11-15

**number of tvs in the house**

0  
1  
2  
3  
4

years

$0 \leq a < 10$   
 $10 \leq a < 20$

**shoe size of 7 year olds**

3  
 $3\frac{1}{2}$   
4  
 $4\frac{1}{2}$

**age of children in secondary school**

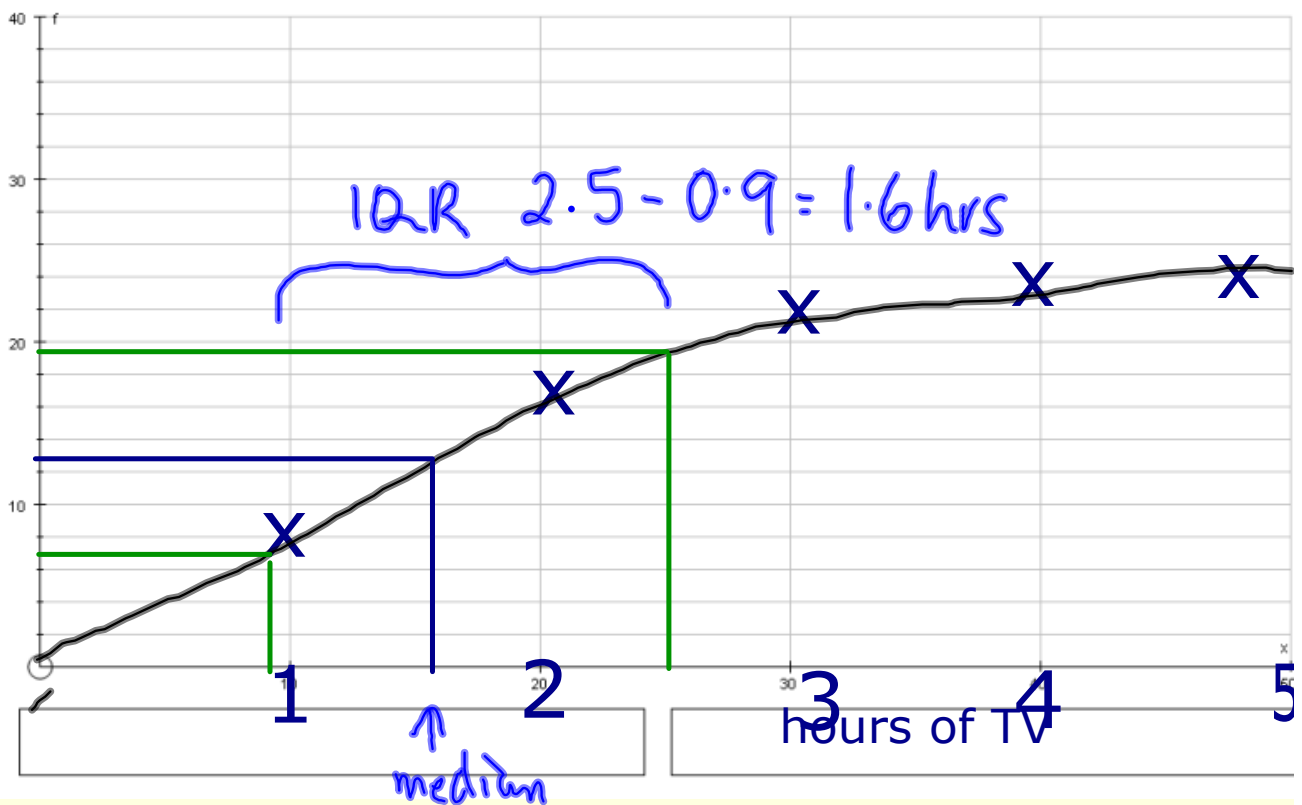
**age at which people make their first plane journey**

## Cumulative Frequency

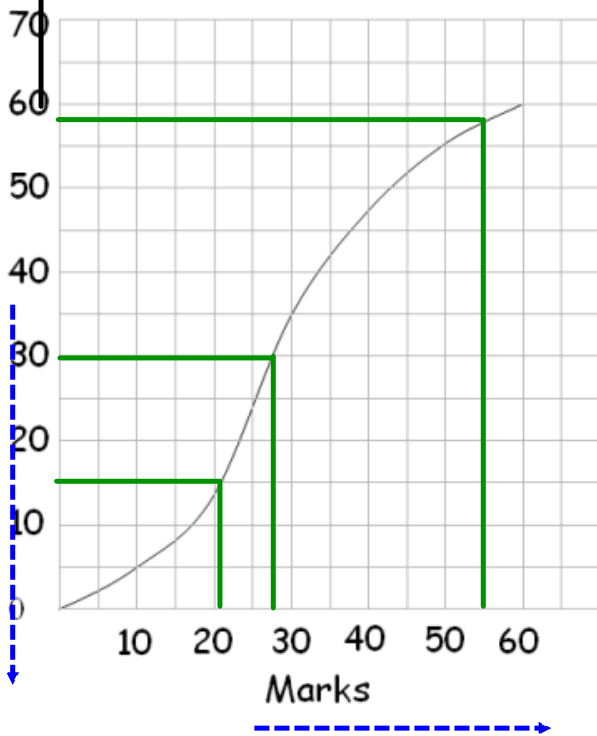
How many hours of TV do you watch on a Saturday (approx?)

hours	freq	cumulative frequency
$0 < h \leq 1$	8	8
$1 < h \leq 2$	9	17
$2 < h \leq 3$	6	23
$3 < h \leq 4$	2	25
$4 < h \leq 5$	1	26

cf



### Interpreting Cumulative Frequency Curves



The graph shows the cumulative frequency curve of the marks for students in an examination. Use the graph to find:

- (a) The median mark.
- (b) The number of students who got less than 55 marks.
- (c) The pass mark if  $\frac{3}{4}$  of the students passed the test.

**True or false?**

The inter-quartile range shows the middle quarter.

The median is shown by a line going across 50% of the frequency.

Cumulative graphs can go uphill or downhill.

The median is shown by a line going up from 50% of the data values.

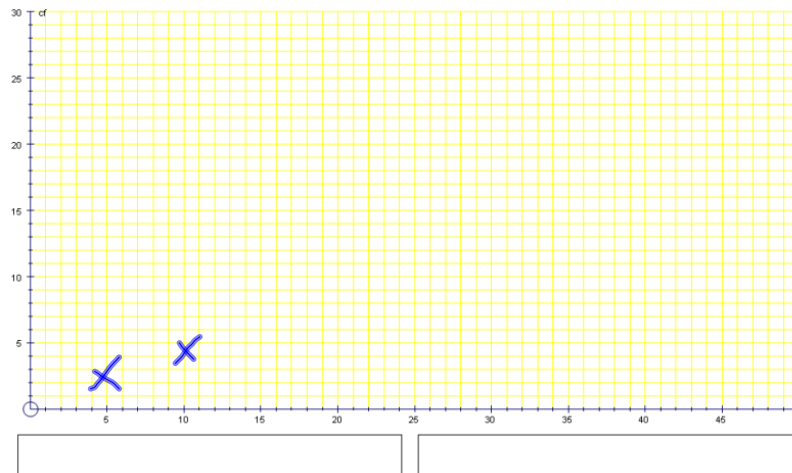
Cumulative frequency graphs usually make an S shape.

Cf, sampling, stem and leaf, frequency polygons.

How many portions of fruit and veg do you eat per week



fruit and veg	frequency		cf
1-5	0	≤ 5	0
6-10	0	≤ 10	0
11-15	4	≤ 15	4
16-20	6	≤ 20	10
21-25	7	≤	
26-30	5	≤	
31-35	4	≤	
36-40		≤	



The median

29.5 Qu 4

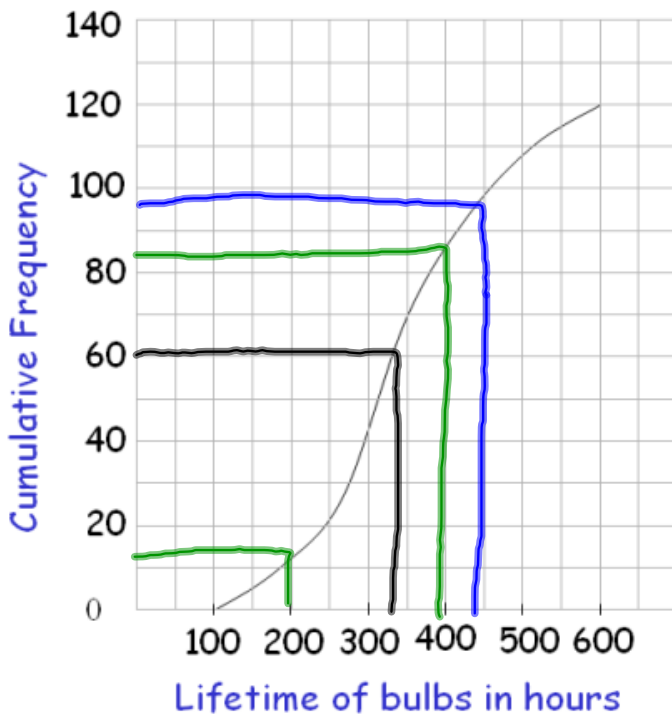
printed sheets from whiteboard maths

Interquartile range = upper quartile  
- lower quartile

$$= 24 - 14 = 10$$

$uq \quad lq$

### Interpreting Cumulative Frequency Curves

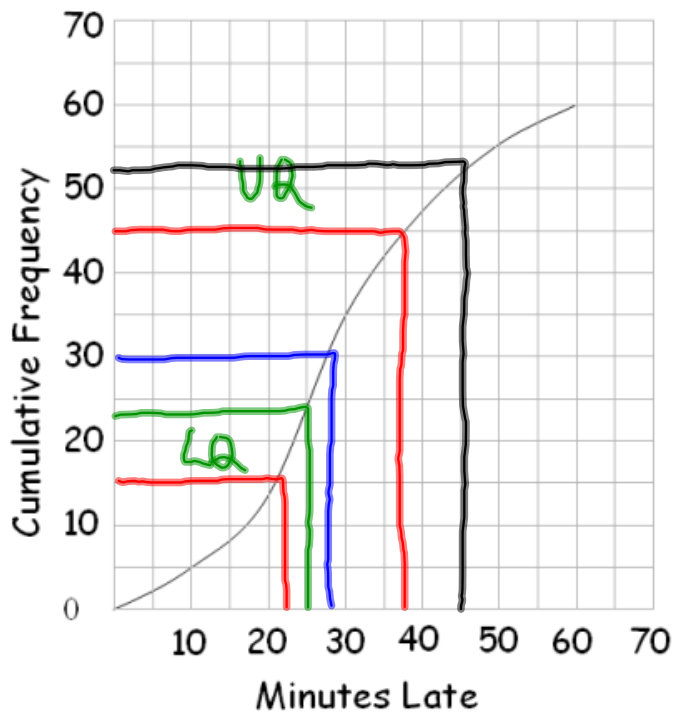


The lifetime of 120 projector bulbs was measured in a laboratory. The graph shows the cumulative frequency curve for the results. Use the graph to find:

- (a) The median lifetime of a bulb.
- (b) The number of bulbs that had a lifetime of between 200 and 400 hours?
- (c) After how many hours were 80% of the bulbs dead?
- (d) What was the shortest lifetime of a bulb?

### The Inter-quartile range

#### Interpreting Cumulative Frequency Curves



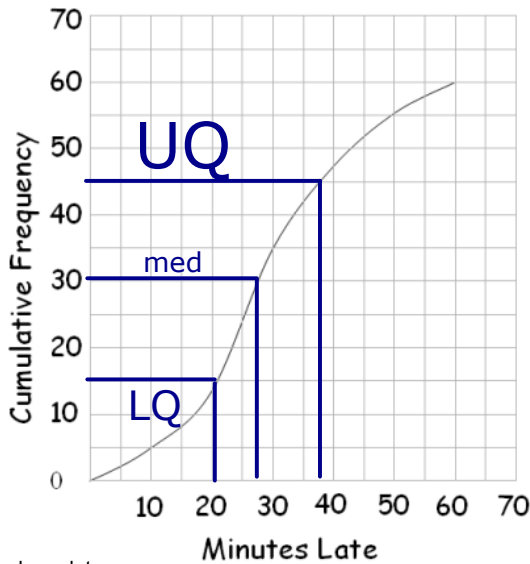
The cumulative frequency curve gives information on aircraft arriving late at an airport. Use the curve to find estimates to

- (a) The median
- (b) The inter-quartile range
- (c) The number of aircraft arriving less than 45 minutes late.
- (d) The number of aircraft arriving more than 25 minutes late.

$$38 - 23 = 15$$

**Box and whiskers (box-plots)**

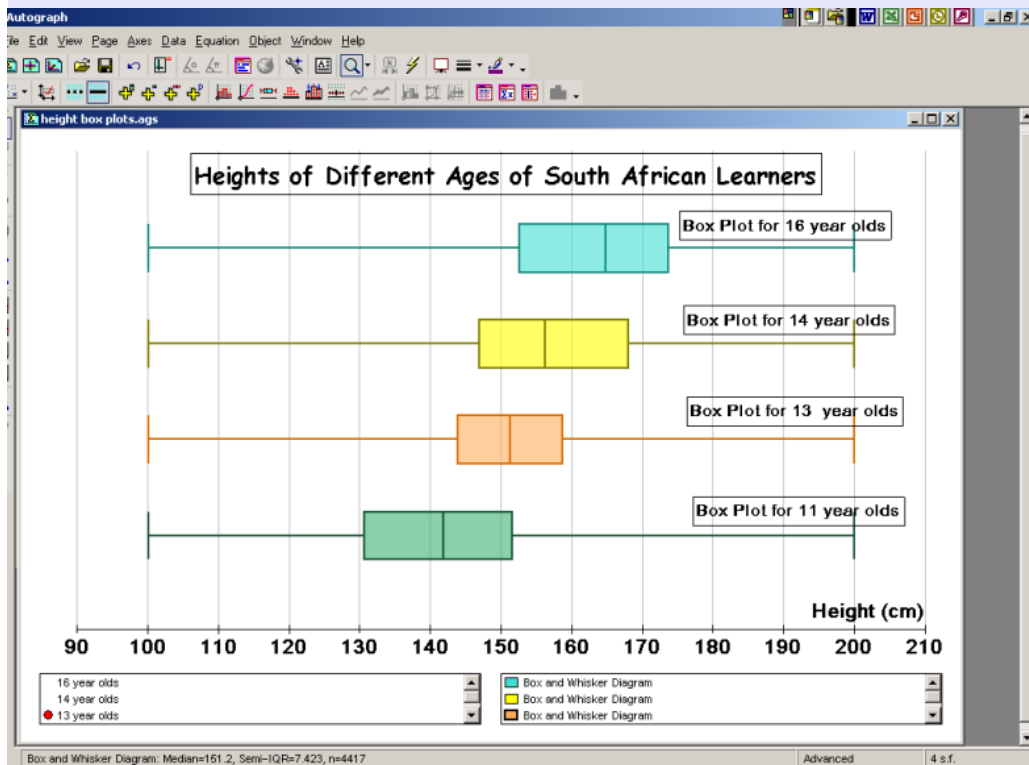
Interpreting Cumulative Frequency Curves



The cumulative frequency curve gives information on aircraft arriving late at an airport. Use the curve to find estimates to

- (a) The median
- (b) The inter-quartile range
- (c) The number of aircraft arriving less than 45 minutes late.
- (d) The number of aircraft arriving more than 25 minutes late.

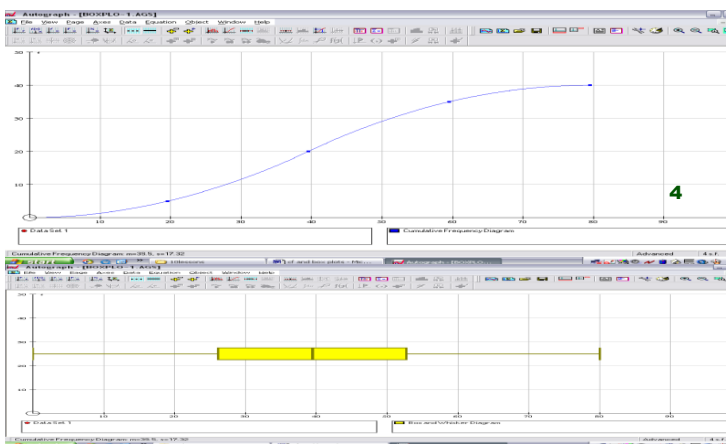
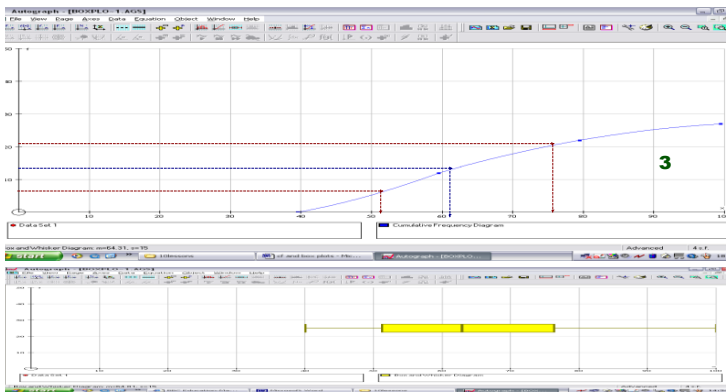
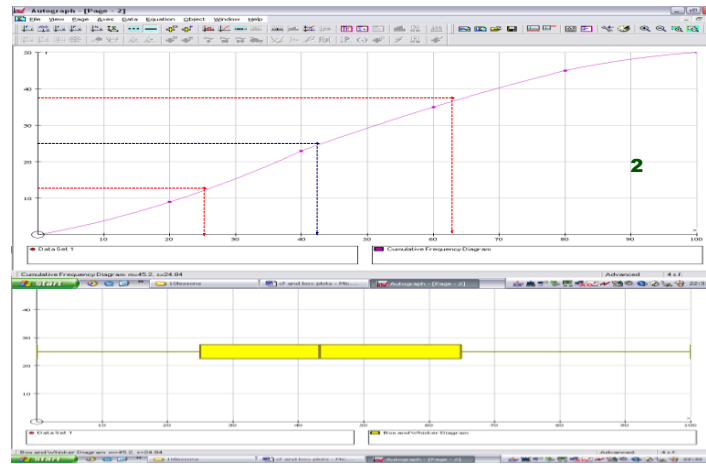
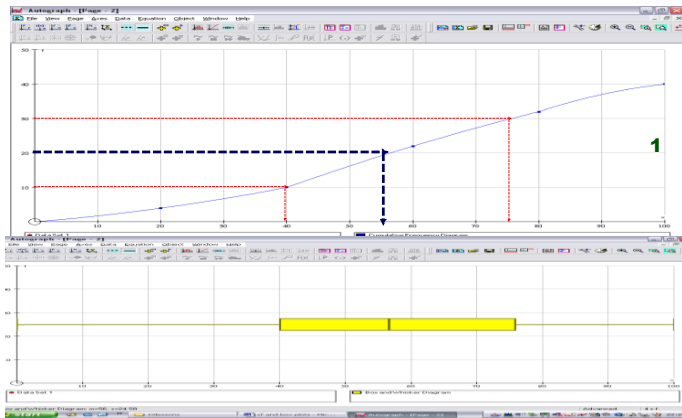
Draw a box plot



# Cf, sampling, stem and leaf, frequency polygons.

## Cumulative Frequency Graphs

Mark the median and quartiles on each graph. Draw a corresponding box plot.



Which of these collections of data would be suitable to display as a cumulative frequency graph?

*Children's hair colour*

Children's height

*Favourite pop groups*

Hours of T.V. watched

Amount of pocket money received each week

NUMBER OF PLATES OF CHIPS SOLD IN THE CANTEEN EACH DAY.

## Cf, sampling, stem and leaf, frequency polygons.

p207: sampling elephants

### Sampling

Why sample?

What kinds of sampling could we use?

How big should a sample be?

How could you carry out a random sample?

Random no. generator (calc./comp)

What is a systematic random sample?

Eg choose every 4th piece of data  
Use a dice + number data from 1-6

### **Stratified Sampling**

When a population is divided into subgroups it is important that any sample to be taken from the population is representative of the subgroups. For example, if the population contains 3 times as many year 9s as year 7s then the sample should have 3 times as many year 9s. You must make sure you choose a big enough sample size. So

Separate the population into your strata or categories

Find out what proportion of your population is in each category

You can then randomly select your sample from the population

In this class there are:

21 boys and 9 girls  
so any survey should have 70% boys and  
30% girls.

p 211

$$D1 \quad \text{males } \frac{97}{212} \times 100 = 45.75\% \quad \downarrow$$

$$\text{females } \frac{115}{212} \times 100 = 54.25\% \quad \downarrow$$

= 23

$$\text{Males: } \frac{45.75}{100} \times 50 = 22.875 \text{ people}$$

$$F = 27.125 \text{ people}$$

= 27

page 154

E2 - E6

Cf, sampling, stem and leaf, frequency polygons.

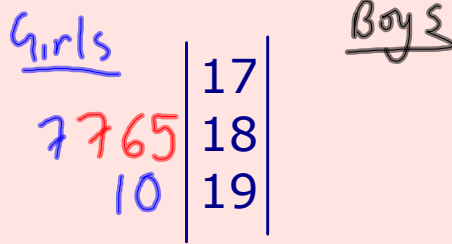
Stem and Leaf Diagrams.

Estimate \_\_\_\_\_'s height. You have one estimate each.

Record results:

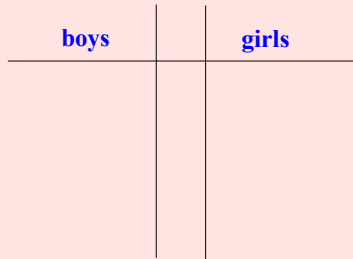
		193	192	191	189
	182	194	188	187	189
	190	190	194	191	184
196	192	191	189	190	
187	195	193	176	<del>185</del>	
		187	177	<del>187</del>	
				<del>186</del>	

A Stem and Leaf Diagram to display the results.



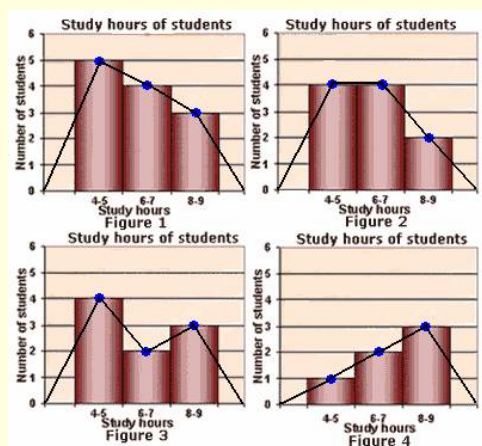
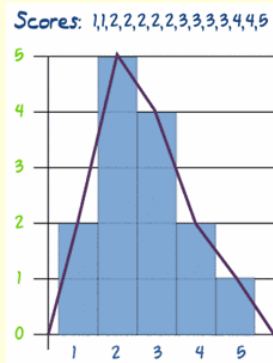
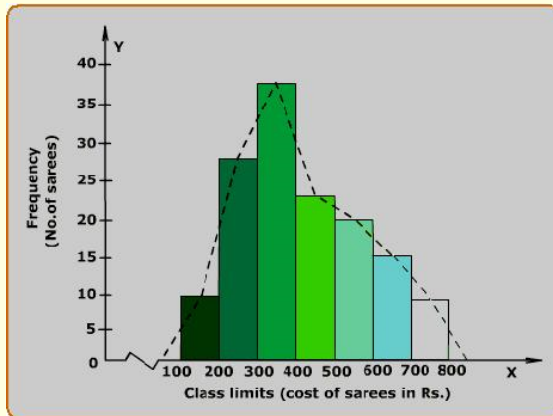
Estimate \_\_\_\_\_'s arm span. You have one estimate each.

Record results:



Finding the median and range using a stem and leaf diagram

Frequency Polygons

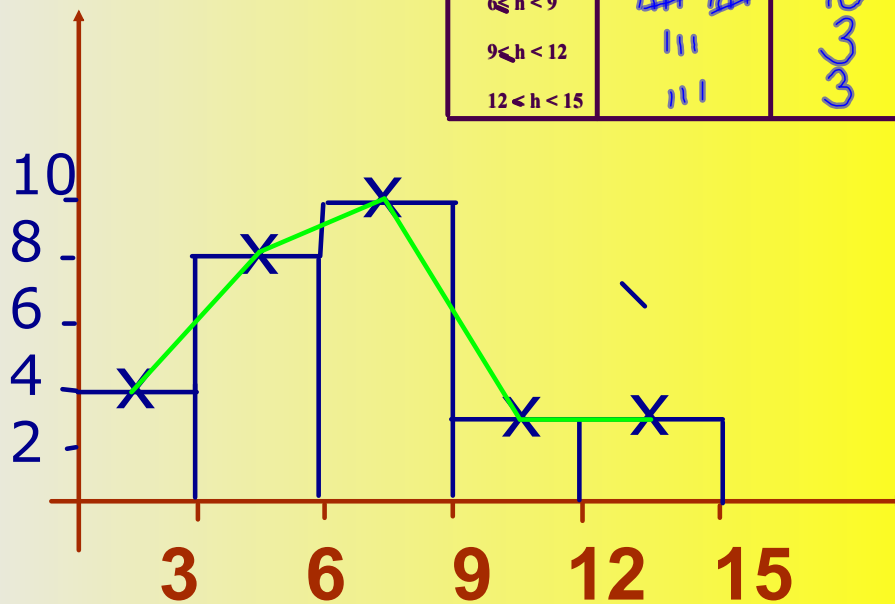


## Frequency Polygon

How many hours of sport do you do a week?

secret : draw a bar chart first

Hours	tally	frequency
$0 \leq h < 3$		4
$3 \leq h < 6$		8
$6 \leq h < 9$		10
$9 \leq h < 12$		3
$12 \leq h < 15$		3



p65

# Moving Averages



Jane is on a diet. She weighs herself every week over 10 weeks. These are the results.

week 1	2	3	4	5	6	7	8	9	10	
	59	60.5	61	59.5	58.5	59	57.5	58.5	57	58.5



She finds the average weight over each 4 weeks (a 4 point moving average). Find the general trend.

weeks 1-4	60
weeks 2-5	59.9
weeks 3-6	59.5
weeks 4-7	58.6
weeks 5-8	58.4
weeks 6-9	58
weeks 7-10	



p67-69

## Data project

### Introduction

1. State your hypothesis.
2. Why did you chose it?
3. Do you expect it to be true?
4. Where does your data come from?
5. How did you collect it?
6. Draw a summary table of your results.
7. What observations can you make from the data?
8. How are you going to use the data to test your hypothesis?

### Your Analysis of the data

1. Draw graphs
2. What can you conclude from each?
3. Find averages.

There should be a running commentary linking the graphs and highlighting any important facts that emerge from them.

### Your Conclusion

Write a paragraph summarising what you have found

Indicate any limitations you have come across.

How could you have improved the project?

**"best stats ever" link (The Hans Rosling talk you heard in class)**



## Attachments

---

cf for fuit and veg.agg